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REQUIREMENTS

MUNICIPAL SLUDGE MANAGEMENT: ENVIRONMENTAL FACTORS

OCTOBER 1977

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF WATER PROGRAM OPERATIONS
MUNICIPAL CONSTRUCTION DIVISION
WASHINGTON, D.C. 20460

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EPA Review Notice

This technical bulletin has been reviewed by the Environmental Protection Agency and approved for publication in order to provide guidance for evaluating sludge management options of grant applications for construction of publicly owned treatment works under Section 203(a) of the Federal Water Pollution Control Act as amended.

The contents of this bulletin do not necessarily include all of the available alternative technologies nor is this report designed to exclude the development and use of additional new technologies. EPA encourages the use of all innovative and cost-effective municipal sludge management options.

NOTES

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This Technical Bulletin has been prepared to assist Environmental Protection Agency (EPA) Regional Administrators in evaluating grant applications for construction of publicly owned treatment works under Section 203(a) of the Federal Water Pollution Control Act as amended. It also provides designers, municipal engineers and others with information on sludge management options. Disposal methods discussed are land disposal, incineration, ocean dumping, and application to agricultural land. Guidelines are presented for environmental impact statements for sludge disposal.

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MUNICIPAL SLUDGE MANAGEMENT: ENVIRONMENTAL FACTORS

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Water Program Operations
Washington, D.C. 20460

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U.S. ENVIRONMENTAL PROTECTION AGENCY

TECHNICAL BULLETIN

MUNICIPAL SLUDGE MANAGEMENT: ENVIRONMENTAL FACTORS

FOREWORD

This Technical Bulletin has been prepared to assist Environmental Protection Agency (EPA) Regional Administrators in evaluating grant applications for construction of publicly owned treatment works under Section 203(a) of the Federal Water Pollution Control Act as amended. It also provides designers, municipal engineers and others with information on sludge management options.

The Bulletin was developed from the outputs of an Agency workgroup that attempted to prepare an Agency policy statement and guidelines on sludge management. These efforts were undertaken with substantial assistance provided by individuals from the Council on Environmental Quality, the U.S. Department of Agriculture, the Food and Drug Administration, and the Department of the Army.

The relative risks, benefits and costs of various sludge management practices should be thoroughly considered when evaluating potential alternatives for specific projects. While some degree of risk is inherent in any sludge management option, trade-offs among risks, benefits and costs should help direct projects toward the selection of both an environmentally and economically viable utilization or disposal alternative.

The Bulletin addresses only factors important to the environmental acceptability of particular sludge management options and does so in a general manner to allow a maximum flexibility in its interpretation to meet varying Regional needs and site specific factors. It was not written as a regulatory document or design manual. An environmental assessment/environmental impact statement procedure is used to determine the acceptability at a specific site. This procedure is described in EPA's regulations for "Preparation of Environmental Impact Statements" (40 CFR 6, Appendix I).

The cost-effectiveness of a proposed sludge management option is of great importance. Information on the EPA cost-effectiveness program is contained in Appendix I. Detailed information on pretreatment guidelines and regulations, sample collection/preservation/analysis procedures, as well as in-depth reviews of the somewhat controversial potential environmental impacts of land application are or will be covered in additional supporting documents.

While the main body of the Bulletin includes considerable detailed information on land application alternatives, it is not intended to indicate a preference for this or any other sludge management option. The Bulletin emphasizes land application alternatives since no EPA guidance has been issued on this subject in the past. It incorporates existing Agency guidance (and regulations where applicable) on the other major options - incineration, landfill and ocean disposal - mainly by means of references and appendices. It is important that all of the available options must be considered, including incineration and landfilling as well as land application, to assure that the best alternative, in terms of environmental acceptability, cost-effectiveness and benefit, is selected.

The requirements of the Act for higher levels of wastewater treatment will result in a substantial increase in the quantity of sludge produced at publicly owned treatment works. Disposition of these sludges is not simple. Methods used in the past are now restricted by specific laws or regulations, or are subject to other constraints in view of new information of environmental significance.

EPA, continuing the work of its predecessor agencies, has been developing environmentally acceptable methods for the management of municipal sludge since the enactment of the first Federal water pollution control laws. The initial phases of the research program were concerned with the characteristics and dewatering properties of primary and secondary sludge because of the need to dewater sludge before its ultimate disposal. The current program emphasis has shifted toward development of improved technology for returning the sludges to the environment in an acceptable manner. Also, the Agency is requiring new measures, such as source control and pretreatment, which should reduce the heavy metals problem associated with sewage sludges.

The Agency has been aware of the growing sludge disposal problem and the need to verify and expand the technology that is now being utilized. For example, a long-term land application project has been directed at determining the beneficial uses of sludge for strip mine reclamation and for soil enrichment in crop production. These studies have carefully monitored the heavy metals uptake in various forage and grain crops.

A large increase in the amount of sludge generated has occurred with the use of chemical precipitants for nutrient control and the upgrading of secondary treatment facilities. The Agency has been actively developing new technology for solving the problem, including recovery and reuse of the chemical additives.

EPA will continue its broad based research program for municipal wastewater sludge management. Depending on the availability of resources, we will concentrate on demonstration of new technologies which will recycle or reuse resources, reduce energy requirements, or recover residuals contained in sludges.

For example, new technologies are being examined to determine if there are cost-effective methods for producing or recovering marketable products in the processing of sludge. These products may include: metals recovery, simple organic acids, fertilizer bases, soil conditioners, the recovery of process heat, fuels for energy production, and activated carbon.

Health effects research will include investigation into land application, disinfection, composting, and airborne contaminants from incineration. The improved technology for reducing or eliminating pollutant emissions to the environment will be evaluated from a health and ecological effects standpoint. It is also EPA's intent to continue cooperative agreements with local, State and other Federal agencies.

The Technical Bulletin is based on current knowledge. It will be modified from time to time as additional information becomes available from current and future research, development, and demonstration projects as outlined above. New research, development, and demonstration projects which offer potential for reducing costs or improving technology are encouraged; this includes projects that do not meet the specific recommendations of the bulletin, if there is reason to believe that they will eventually be acceptable. This Bulletin will also be supplemented by a series of detailed technical reports on topics of major concern. The first: "Application of Sewage Sludge to Cropland: Appraisal of Potential

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Hazards of the Heavy Metals to Plants and Animals" (EPA 430 9/76-013) is already available. [A copy of this report can be obtained by writing to the General Services Administration (8 FFS), Centralized Mailing Lists Services, Bldg. 41, Denver Federal Center, Denver, CO 80225. Please indicate the title of the publication and MCD-33.]

It is believed that the techniques discussed in this bulletin can be environmentally acceptable if properly designed, constructed and managed. It must be well understood that proper operation, maintenance, and monitoring of any sludge management system are essential. The operators of such systems must clearly demonstrate the managerial capability and resources necessary to achieve and maintain the expected performance on a continuing basis.

The guidance and recommendations in this technical bulletin are subject to revision based on future experience in the field. All users are encouraged to submit suggested revisions and information to the Director of the Municipal Construction Division (WH-547), Office of Water Program Operations, U.S. Environmental Protection Agency, Washington, D.C. 20460.

Thomas C Jorling

Assistant Administrator
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Dated: OCT 26 1977

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U.S. ENVIRONMENTAL PROTECTION AGENCY

TECHNICAL BULLETIN

MUNICIPAL SLUDGE MANAGEMENT: ENVIRONMENTAL FACTORS

Chapter I

INTRODUCTION

1-1. The treatment of wastewaters for pollutant removal produces not only relatively clean water for discharge, but also a significant quantity of residue material. For domestic sewage, treated in publicly owned plants, this residue is essentially organic in nature, although measurable quantities of metals, minerals, and other compounds are also invariably present. The residue may also contain pathogenic organisms which survive the wastewater treatment process. Where industrial wastewaters are treated together with domestic sewage, the potential for additional materials of concern in the resulting sludge is increased.

1-2. Depending upon the composition of the wastewater treatment plant sludge and the quantity involved, disposal of this residue material can have a significant impact on the environment. It is essential for wastewater treatment installations to consider the proper disposal of treated wastewater, as well as all byproducts and residues such as sludge. The requirements of the Federal Water Pollution Control Act, as amended (P.L. 92-500), emphasize the need for environmentally sound means for sludge utilization or disposal. The national requirement under P.L. 92-500 for secondary treatment, for example, will result in production of greater quantities of sludge.

1-3. The disposition of wastewater treatment plant sludges is a complex problem. It can affect the quality of air, land, and water, and requires considerations of human health, animal health, plant growth, and protection of ground and surface water from pollution. EPA Regional Administrators must consider all these matters as they evaluate sludge management systems included in the design of publicly owned treatment works for which construction grant applications are made. Despite the still limited information available on the complex issue of sludge utilization and disposal, the need for definition of a baseline of acceptable sludge utilization or disposal practice remains. Such a baseline is planned for development under the authorities of the Resource Conservation and Recovery Act (P.L. 94-580).

1-4. For the reasons cited above, a description of items to consider when selecting a specific sludge utilization or disposal alternative are presented in this document. This technical bulletin provides general guidance on the factors to be considered in the environmental assessment and to be used in reviewing the facts of a particular situation. For the utilization and disposal methods discussed no attempt is made to limit the implementation of innovative technologies or to imply that any particular method is optimum for sludge utilization or disposal. The final determination of acceptability should be based on the environmental assessment and, if necessary, the environmental impact statement for a specific project.

1-5. The bulletin is divided into two distinct parts. The first part includes methods in which the sludge is utilized as a resource by land application. The second part describes those methods where a beneficial use is not emphasized. Systems involving the recovery and utilization of energy or residuals contained in sludges are not specifically covered in this document. Examples of such systems are the production and utilization of digester gas, incinerator gas or steam; recovery and reuse of chemical conditioners; recovery and sale of metals. However, the environmental impacts associated with energy recovery systems would be similar to those identified for the sludge incineration practices covered in this bulletin.

1-6. Methods which may have future promise, but which have not been used in existing facilities, are not included. As these developing technologies are demonstrated in practical use, and as supporting information is obtained, they will be added in updates of this bulletin. Because it is the policy of EPA to encourage and, where possible, assist in the development of new or advanced wastewater treatment procedures, Federal grant funds may be awarded for the construction of sludge utilization or disposal facilities not addressed in the bulletin, provided sufficient information is presented by the grant applicant to determine that these facilities would meet applicable statutory and regulatory requirements and would be environmentally acceptable.

1-7. Proper operation, maintenance, and monitoring of sludge utilization or disposal practices are essential to ensure that adverse environmental effects do not result. Grant applicants must demonstrate that they will have managers, operators, and resources necessary to achieve and maintain the required performance on a continuing basis.

1-8. Efficient energy utilization, conservation and recovery are increasingly critical topics. Full consideration of these factors is necessary in the comparison of alternatives in the selection of a sludge management method.

LAND APPLICATION OF SLUDGE

2-1. General. In order to contribute to energy and resource conservation in wastewater treatment facilities, sludge management technologies which will beneficially recycle or reuse sludges are actively encouraged. Because land application of sludge provides an excellent soil conditioner while conserving and recycling organic matter, nitrogen, phosphorus, and certain essential trace elements, such utilization is encouraged when it is supported by an environmental assessment.

Specifically, the use of stabilized sludge by land application for enhancement of parks and forests and reclamation of poor or damaged terrain should be considered for the utilization of sludge. Application of stabilized sludge to agricultural lands may also be regarded as an environmentally acceptable method of sludge utilization/disposal, but must be examined closely in terms of protection of human health and future land productivity. This is due to the present limited knowledge and uncertainties as to the extent to which this practice could result in the entry of toxic substances into the human food chain and pose a health risk.

Regulations, criteria, and guidelines being developed under the authorities of P.L. 92-500, TSCA, RCRA and other recent environmental legislation may impact the future acceptance of various land application practices in various ways. The development of criteria and guidelines under RCRA will define acceptable levels of pollutants for land application of solid wastes. The implementation of the anticipated Agency pretreatment strategy now under development will substantially reduce contaminant concentrations of many municipal wastewater treatment plant sludges (especially cadmium and persistent organics). These efforts should further enhance the acceptability of sludges for agricultural uses. By this emphasis on prevention of future problems, we hope to move toward a goal of waste recovery and recycling.

The environmental concerns associated with the beneficial utilization of sludge by land application practices are discussed at length in the following paragraphs.

2-2. Information for Project Evaluation.

2-2.1 Sludge Characteristics. Sludge from existing plants should be tested to determine nutrient values, heavy metals, and other constituents which may be economically recycled or cause environmental damage (Appendix VII). The type of tests and their scheduling is site specific and dependent on regulatory requirements, the intended use of the sludge, the contaminants likely to be present, and the intended use of the crop if one is grown. For new projects, it will be necessary to estimate the sludge characteristics; the application rates actually used on a project should, however, be based upon actual sludge analyses. Some indication may be available from pilot plant studies, but such studies are rarely conducted at smaller plants.

When sludges are to be applied to land, for beneficial purposes, appropriate non-domestic users of municipal wastewater treatment works should be required to pretreat their wastewaters to minimize the presence of potentially harmful heavy metals and other sludge contaminants from industrial sources. Pretreatment requirements should meet Federal pretreatment standards. (Current pretreatment regulations are covered in 40 CFR Parts 128 and 403. Also, see "Federal Guidelines: State and Local Pretreatment Programs," EPA 430/9-76-017a,b,c.). However, quantities of these materials also may be present in wastewaters usually considered of non-industrial origin.

2-2.2 Site Soils. Soils receiving sludge for agricultural purposes, should be tested for phosphorus, potassium, pH, and heavy metals. There should also be knowledge of the approximate soil cation exchange capacity. Soils data and surveys are available through the Soil Conservation Service. Soil testing also can be arranged through local county agricultural extension agents, State Agricultural Experiment Stations and private laboratories. The number and extent of these tests may be minimal for largely domestic sludges where the application rates are low (paragraphs 2-3.10 and 2-4), or where certain soil survey information already exists.

2-2.3 Groundwater. A review of existing information and/or an investigation of groundwater conditions should be made for sites where sludge is to be applied to the land at greater than crop fertilizer rates (paragraph 2-3.8). Attention should be paid to the sites' geology and soil physical properties to avoid areas underlaid by highly porous, fractured or stratified formations. The extent of the evaluation should be based on the size of the project and the potential impact on groundwater. Maintaining the pH of the combined soil and sludge above 6.5 will help prevent solubilization and migration of most metal ions into the groundwater.

2-3. General Requirements for Land Application of Sludges

2-3.1 Stabilization. Under most circumstances sludge should be stabilized (by means of chemical, physical, thermal, or biological treatment processes that result in the significant reduction of odors, volatile organics and pathogenic organics) before land application to reduce public health hazards and to prevent nuisance odor conditions. The stabilization method most frequently used has been anaerobic digestion, but there are numerous other methods producing comparable results. Discussions involving stabilized sludge in this document are based on a product equivalent to, or better than anaerobically digested sludge.

Experience shows that consistent and effective control of odors is a major factor in the public attitudes toward sludge transport, sludge storage and land application techniques. The odor conditions are closely related to anaerobic bacterial action on volatile organic matter in both the liquid and solid portions of the sludge. The degree of volatile matter reduction achieved by anaerobic digestion may vary greatly, depending on the basic digestor design and the percentage of volatile solids in the raw sludge. Well designed and carefully operated high rate anaerobic digestors can digest sludge to control odors and reduce pathogen concentrations when the sludge is digested for at least 10 days at 95° F. Such high rate digestion requires close operational control for successful performance. Smaller plants usually use standard rate digestion. [Although digestion can reduce the number of influent fecal coliforms by 97 percent or more, the remaining levels of microorganisms may still have public health significance.]

Other methods to prepare sludge for land application may be used. Some examples are: composting of raw as well as digested sludge, aerobic digestion, chemical treatment (lime treatment, etc.), heat stabilization, or heat drying. In cases where stabilization is determined to be necessary, the grant applicant should show that the performance of the alternative used for preparing the sludge is equivalent to anaerobic digestion in reducing odor potential and volatile organics.

Chemical treatment of sludges may only provide temporary inhibition of odors. Incorporation of the sludge into the soil is recommended for those sludges which have odor potential (paragraph 2-3.7).

At some plants, stabilized sludge is spread on drying beds or temporarily stored in properly designed sludge lagoons. These methods decrease subsequent odor problems from sludge applied to land since additional stabilization occurs with time. Caution must be exercised, however, to ensure that there are no objectionable odors from the storage site.

2-3.2 Additional Pathogen Reduction. Under certain conditions (e.g., due to State regulatory requirements controlling public access or for projects involving hospital wastes), it may be necessary to achieve additional bacteria, parasite, and/or virus reduction or deactivation beyond that attained by stabilization. The following methods have been used:

a. Pasteurization for 30 minutes at 70°C.

b. High pH treatment, typically with lime, at a pH greater than 12 for 3 hours.

c. Long term storage of liquid digested sludge for at least 60 days at 20°C or 120 days at 4°C.

d. Complete composting at temperatures above 55°C as a result of oxidative bacterial action and curing in a stockpile for at least 30 days.

e. Both gamma and high energy electron ionizing radiation under various application procedures including combination treatment with thermal conditioning and oxygenation.

2-3.3 Crops Suitable for Sludge Application. Crops vary in their reaction to sludge enriched soils. Most crops benefit from the nutrients, such as nitrogen and phosphorus, and organic matter present in the sludge. However, some crop species may be adversely affected by excess heavy metals or other contaminants. Additionally, the crop may take up and accumulate certain of these trace elements, and possibly inhibit future use of the harvested materials, particularly those in the human food chain.

The degree of contaminant uptake by different crops and specific plant tissues is highly variable. For example, vegetative portions of grasses generally contain higher levels of heavy metals than the grain. Factors such as soil type, pH, moisture, and organic matter content, crop species and variety (and for cadmium, the annual and accumulative application rates) are all important and affect plant uptake rates of specific contaminants. Vegetables such as lettuce, spinach, and chard, as well as tobacco are among the highest accumulators of heavy metals such as cadmium. USDA extension and research offices and State Agricultural Experiment Stations are available for additional guidance on the selection of crops which can be satisfactorily grown on sludge enriched soils in specific geographic areas.

Forest sites and reclamation projects offer special opportunities for beneficial use of sludge to improve soil fertility and increase plant growth without significant risk to public health. In these cases it will still be necessary to comply with regulatory requirements pertaining to impacts on air, surface waters, and groundwaters, in a manner similar to that described for agricultural uses (paragraph 2-3.8).

2-3.4 Public access should be controlled in a positive manner where applications are above rates for agricultural use. In such instances, posted notices, and/or simple barriers, fences, remoteness of the site should be adequate.

2-3.5 Groundwater Protection. Projects for land application of sludges will be designed so that the permanent groundwaters (groundwater which is not removed from the ground by an underdrain system or other mechanical means) in the zone of saturation (where the water is not held in the ground by capillary tension) will be protected from pollution. Consideration should be given to the extent of the project, the quality of the groundwaters, and the fact that groundwater is typically used for drinking water supply with little or no additional treatment. Also, in some areas, groundwater recharge of surface streams may be significant. Specific groundwater criteria will be developed under P.L. 94-580. Until such criteria are developed under P.L. 94-580, criteria contained in the EPA publication, "Alternative Waste Management Techniques for Best Practicable Waste Treatment," EPA 430/9-75-013 should be followed. (An extract on groundwater is reproduced as Appendix II to this Bulletin.)

2-3.6 Controlling Surface Water Runoff. Sound engineering practice requires the control of surface runoff that may leave the site as well as that which will enter the site from contiguous properties. Controlled release of runoff from sludge application areas and effective erosion control methods must be practiced as necessary. Consideration should also be given to materials which may leach out of the sludge. Surface water criteria are to be developed under P.L. 94-580.

2-3.7 Sludge Application Methods. Techniques for applying liquid sludge to the land include: tank truck, plowing, injection, or ridge and furrow spreading. Dewatered sludge, or composted sludge, may also be spread upon the land. If desired, the sludge can be incorporated into the soil by plowing, discing, or other similar methods. The use of incorporation and injection methods is encouraged as a means of improving public acceptance of sludge application by decreasing possible odor generation and unsightly deposits on crops.

Sprinkler application of digested sludge to the land is acceptable when the transport of aerosols beyond the boundaries of the application area is minimized. The use of low pressure sprinklers, short risers, or remoteness of application sites is suggested. When sprinkling at low pressures, it is good engineering practice to screen the sludge or otherwise prevent nozzle plugging.

2-3.8 Application Rates. The sludge application rate per acre should be determined in a manner to ensure that environmental requirements are met. Nitrogenous substances usually limit annual application rates. The rate of sludge application to land should be consistent with the requirement to prevent nitrate pollution of groundwater as previously defined (paragraph 2-3.5). The information required to establish the maximum sludge application rate based on plant available nitrogen includes: (1) total and inorganic nitrogen content of sludge; (2) nitrogen, phosphorus, and potassium requirements of crop proposed; and (3) soil test for available nitrogen, phosphorus and potassium. Supplemental fertilizer, especially potassium, may be needed if optimization of crop production is desired.

As a guide, sludge application rates should provide total plant available nitrogen equivalent to the nitrogen fertilizer requirement of the crop grown, although some experience in applying 1½ to 2 times the crop's nitrogen fertilizer requirement has not lead to the development of groundwater problems. Plant available nitrogen includes that mineralized from the soil, the inorganic sludge nitrogen (ammonium and nitrate),

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plus a mineralization rate of 15 to 20 percent of sludge organic nitrogen (mineralizable organic nitrogen) for the first growing season following application, and three percent of the residual sludge organic nitrogen for three subsequent growing seasons. Volatilization of ammonia from surface applied sludge should be taken into account; experience has shown that about 50 percent of this nitrogen may be lost if the material is not immediately incorporated. Denitrification may also be a factor accounting for significant nitrogen losses under certain conditions.

Sludge nitrogen mineralization, volatilization, and denitrification rates may vary considerably for different climatic areas of the Nation. USDA extension and research offices, and State Agricultural Experiment Stations should be contacted to obtain specific regional information on nitrogen transformation rates, plant nitrogen, phosphorus and potassium requirements and soil test information for the local area.

An excess of certain salts, phosphorus compounds, heavy metals, persistent organic compounds, radionuclides and other materials in sludges may also limit application rates. Each prospective land application site should be assessed on an individual basis, with adequate consideration given to sludge characteristics, soil characteristics, crops to be grown, and other factors such as surface water and groundwater protection. Control of the total and annual application rates along with soil pH control and intensive monitoring programs are possible approaches which can be used to avoid problems with major contaminants of concern such as cadmium (section 2-4.2). A useful procedure for calculating the rate of sludge application to the land based on the nitrogen requirement of the crop grown and the nitrogen and metal content of the sludge is given in Appendix VIII.

Sludge is generated continuously throughout the year, but continuous field application may not be possible. A mass balance is necessary to determine the amount of sludge storage required during intervals when the sludge is not applied to the land.

2-3.9 System Operation. The grant applicant should show the capability to manage and operate the system. Operational aspects to be described in the operation and maintenance manual include the monitoring plan, review of monitoring data, action to be taken when monitoring indicates a problem, and a commitment to use expert guidance when required. The operation and maintenance manual should specifically indicate what actions can be taken to either upgrade the site to acceptable levels or discontinue its use if it is shown to be in violation of future requirements developed by Federal or State regulatory agencies.

USDA extension and research programs are also available to help develop and provide site specific recommendations for the best agricultural practices for use of municipal sewage sludge by farmers on privately owned lands. Extracts from such guidance that has been developed for the North Central and Western states is provided in Appendix VIII. These recommendations may include suggestions to help minimize or eliminate some monitoring requirements on the farm while protecting farmland for future agricultural use, maintaining normal productivity, and assuring continued farm income.

2-3.10 Monitoring. The grant applicant should develop and implement a plan for adequate monitoring of each land application site where the application rate may impose a significant nitrogen loading on receiving ground or surface waters (paragraph 2-3.8), where greater rates of metals are applied than indicated in section 2-4.2 or where hazards are expected from other sludge constituents such as pathogens or persistent organics. Groundwater monitoring generally should not be required where the application rate is based upon the nitrogen fertilizer needs of the crop (paragraph 2-3.8).

It will always be necessary to know the characteristics of sludge (paragraph 2-2.1) to be applied. For new projects, it may be necessary to monitor more frequently until successful performance is assured.

The monitoring plan should be specifically designed for local conditions including site and sludge characteristics, proposed rate of application, crops to be grown, size of the project, etc. Where necessary, the plan should consider monitoring heavy metals, persistent organics, and pathogens, as well as nitrates in groundwater, surface water, sludge and soils. In addition to these recommendations and local or State requirements, additional monitoring requirements may be developed under P.L. 94-580.

2-3.11 Surveillance of Operation and Monitoring. The operation and monitoring data of the system must be periodically reviewed by the responsible regulatory Agency or agencies to ensure satisfactory performance. Where there is no local or state program for this purpose, an alternative independent review should be established. The grant application should show the arrangements made for surveillance.

Operational and monitoring data must be available to authorized local, State, EPA and other Federal agency representatives on request.

2-4. Additional Requirements for Sludge Application to Agricultural Lands. In addition to the foregoing general requirements, the application of sludge to agricultural lands should be accomplished so as to ensure cropland resources are protected and harmful contaminants are not accumulated in the human food chain to create a risk to public health. Review of projects which include application of sludge to agricultural lands must be based on informed judgment and fully consider the conditions specific to a given site.

2-4.1 Research, Development and Demonstration Projects. As indicated earlier (paragraph 1-6), it is the policy of EPA to encourage and, where possible, assist in the development of new or advanced wastewater treatment procedures, including sludge processing, utilization and disposal practices. Therefore, proposals involving the demonstration of new and innovative technologies for sludge management should be encouraged and expedited.

For such demonstration projects (e.g., reclamation of disturbed land with sludge), where significant resources and manpower are available for control and monitoring, the recommendations within this Bulletin may be exceeded in an effort to investigate new approaches for sludge management. An environmental assessment should verify that this is the case for particular projects. Some demonstration projects have the capability (including in-house effort and consultant assistance) to intensively monitor and evaluate the project as it develops. Work on these projects should be closely coordinated with EPA, USDA and FDA, as well as State and local authorities, to ensure satisfactory results including acceptable crop quality if crops grown are to be marketed (as described under section 2-4.2 B). Control criteria for these projects should be subject to continuing modification as information is developed. For these research, development and demonstration projects, the Agency review should assure that adequate resources are made available for the evaluation of project performance, arrangements are established for surveillance of the project, and review of project data is arranged for EPA and other interested agencies such as FDA, USDA, State Agriculture and Health Departments.

2-4.2 Protection of Food Products and Agricultural Lands.

Regulations exist to control the level of mercury and persistent organic chemicals, such as pesticides and polychlorinated biphenyls (PCB's), in certain components of the human food chain. However, similar regulations have not been established for all contaminants in foods. When other regulations are implemented, those sludge land application projects involving the production of crops in the human food chain will have to produce crops that conform to these regulations. Contaminants of particular concern in municipal sludge as related to the production of human food and animal feed crops are cadmium and lead, as well as mercury, arsenic, selenium, and persistent organics such as pesticides and PCB's.

A wide variety of site specific conditions and management variables can affect the level of heavy metals entering crops. These variables have been and continue to be examined by many groups within FDA, USDA and State agencies. It is therefore recommended that projects conform to limitations for crop quality (human food or animal feed) established by these agencies.

The available information concerning the benefits and potential impacts of applying municipal sludge to agricultural land has been reviewed and summarized elsewhere. This available information indicates that many municipal sewage sludges can be applied to agricultural land when good agricultural management practices are employed. Upper limits on annual heavy metals loadings were suggested by various sources, based upon the currently available data base, with the anticipation that modifications will be made in time based upon additional research.

As discussed in section 2-1 elsewhere, regulations, criteria and guidelines being developed under authorities of P.L. 92-500, TSCA, RCRA and other recent environmental legislation may impact the future acceptance of various land application practices in various ways. Pretreatment requirements and solid waste disposal and utilization criteria and guidelines currently under development will provide numerical limitations aimed at reducing the levels of pollutants discharged into the environment, including allowable cadmium additions to agricultural soils through solid waste (including municipal sludge) application. As a result of progressively imposing more stringent pretreatment regulations on industrial wastes discharged into municipal systems, there should be a corresponding reduction of sludge borne contaminants.

Until regulatory requirements are established, the following guidance will allow for the application of most sludges to agricultural land at crop nitrogen fertilizer rates (paragraph 2-3.8).

A. PRIVATELY OWNED AGRICULTURAL LANDS. The following guidance is suggested for application of municipal sludge to privately owned and managed cropland. These recommendations should protect private farmlands for future agricultural use, maintain their normal productivity, and assure continued farm income while minimizing monitoring requirements to those normally used for assuring good soil management:

(i) Annual cadmium loadings. The maximum annual loading of cadmium that should not be exceeded when applying sludge to agricultural land depends upon site conditions and management practices employed. The annual cadmium loadings that have been used successfully range from less than 1 kg/ha up to 2 kg/ha. While lower cadmium application rates are preferable, in those cases where good site conditions (i.e., high pH soils) and good management practices (i.e., soil pH control, monitoring, selecting crop species and varieties that do not readily take up heavy metals, etc.) prevail, annual loadings of 2 kg/ha have been employed. Because of the concern over potential health effects from increased ingestion of cadmium in foods, it is the intent of EPA to move toward minimizing cadmium additions to cropland. Movement toward

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lower cadmium additions will be reflected in the criteria for land application of solid wastes to be developed and issued under the Resource Conservation and Recovery Act of 1976 (P.L. 94-580).

(ii) Soil/sludge pH control. The pH of the soil/sludge mixture should be controlled to limit heavy metal uptake by plants. A pH of 6.5 or greater will minimize uptake of most heavy metals by most crops. As soil pH drops, heavy metal solubility in soil and availability to crops is increased. Under some site specific conditions (as in many strip-mined areas), availability of metals present in the soil before sludge application can actually be reduced by the application of sludge, because sludge addition in itself may tend to raise soil pH of a highly acid soil and because binding of the heavy metals into organic complexes may occur. But it is rare that the final pH will be 6.5 or greater. Therefore, consideration should be given to including supplemental liming. Additional guidance on tailoring soil/sludge pH to specific cropping systems may be gained from local agricultural extension agents, State Agricultural Experiment Stations, USDA, etc. The pH level maintained should be designed to meet the intent of limiting heavy metal solubility in soil and possible movement of heavy metals into groundwater or into crops by uptake.

(iii) Total cumulative metal loadings. It has been demonstrated that the following total cumulative metal loadings from applying municipal sludge to agricultural land have not led to observed problems (when soil pH is controlled):

Metal	Soil Cation Exchange Capacity (meq/100g)* 0 - 5	5 - 15	>15
	Amount of Metal (kg/ha)		
Pb	500	1000	2000
Zn	250	500	1000
Cu	125	250	500
Ni	50	100	200
Cd	5	10	20

* Cation exchange capacity (CEC) determined on soil prior to sludge application by pH 7 ammonium acetate procedure.

NOTE: It is recognized that soil CEC is not the only factor important in setting levels of metal additions to soil. While its use as an index is recommended (providing that soil pH is also controlled) other factors such as soil colloidal, organic and sesquioxide contents may be equally or more important in limiting metal availability.

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(iv) Calculating sludge application rates. A useful procedure for calculating the rate of sludge applications to the land (paragraph 2-3.8) based on the nitrogen and metal content of the sludge is given in Appendix VIII.

In addition to the above, the following measures are also suggested as possible means to overcome problems of dealing with highly contaminated sludges:

(v) Ratio of cadmium to zinc in sludges. It is suggested that in naturally acid soils the ratio of cadmium to zinc in sludge should be considered in addition to total annual rates of application. An important premise of this concept is that with poor management (e.g., improper crop selection and low soil pH), high enough zinc concentrations in soil to kill plants would result before cadmium could accumulate to levels in foods considered hazardous to animals and humans. The preferred practice suggested by USDA and some researchers is to apply sludges (to naturally acid soils) with a Cd/Zn ≤0.015 to these privately owned croplands.

(vi) Pretreatment programs. Implementation of a local pretreatment program aimed at reducing metals discharged into the municipal system may help overcome the problems that must be faced when considering the application of highly contaminated sludges to cropland.

(vii) Other technology. Use of other technology or management aimed at minimizing impact upon soil, groundwater and surface water, crops and/or the human food chain such as the use of selective crop species and varieties that minimize contaminant uptake or application of sludge at less than crop nitrogen needs. In any case, an expanded monitoring program should be implemented to assure control of pollutant migration and quality assurance of the project. The monitoring plan should be capable of noting trends in crop productivity decline, contaminant uptake in final marketed products, groundwater and surface water quality.

B. PUBLICLY CONTROLLED AGRICULTURAL LANDS. When municipal sludge is applied to publicly controlled (owned or leased) land and crops are grown and harvested, higher rates of application may be used if: (1) the use of these rates is acceptable to the responsible regulatory agency(s), and (2) a detailed monitoring program is established to assure acceptable crop quality and to provide close surveillance of groundwater, surface water and soils. If metal additions exceed those recommended in (A) above, priority consideration should be given to growing crops that are not directly consumed by humans.

If human foods or animal feeds are grown and harvested, higher rates of sludge application may be acceptable if resulting levels of cadmium in the crops or meats marketed are comparable to those levels present in similar crops or meats produced locally or as established by FDA or other responsible regulatory agencies. For example, strip mined land which has been reclaimed through high rate sludge application may be used for producing animal feeds; however, organs (e.g., kidneys and livers) which may accumulate cadmium in animals fed such feeds should not be sold for human consumption unless their cadmium levels are comparable to those found in animals produced locally.

C. SITES PREVIOUSLY DEDICATED FOR DISPOSAL. The dedication of publicly controlled or owned land for high rate application (including trenching) to allow maximum utilization of the "dedicated site" for the disposal of municipal sludge has been practiced. This is a particularly useful practice for sludges with high contamination levels or where very high loadings of sludge are desired. Project monitoring is generally established to assure close surveillance of groundwater and surface water as discussed under monitoring of landfills (paragraph 3-1.7).

In cases where crops are grown following the disposal of municipal sludge to such "dedicated sites," the crops are generally not harvested for use as human foods or animal feeds. However, if human foods or animal feed crops are grown and harvested for further use, the marketing of crops and meats produced should be handled as in (B) above.

In all cases where the application of municipal sludge to agricultural lands and production of human foods or animal feeds is proposed (whether on private land, publicly controlled land, or "dedicated sites"), the project should be coordinated at the State and local levels to include the approval of appropriate regulatory agencies.

Experience has shown that under special conditions specific organisms may survive in the soil for extended periods of time. Therefore, unless pathogen reduction by methods such as those listed in 2-3.3, or other suitable measures have been employed to minimize human exposure to such organisms in sludge, additional precautions should be taken to assure that the impact of pathogenic bacteria, parasites and viruses in sludge used for certain agricultural purposes, will be minimal. Measures that have been used include the following:

(a) Sludge-treated land should not be used for growing human food crops to be eaten raw if the edible portion of the plant is in direct contact with the sludge or soils receiving sludges until one year after final sludge application or longer if there are positive indications of viable Ascaris ova. The available data base indicates that Ascaris ova may remain viable in soil for three years or longer.

(b) Use of application methods to prevent direct contact of the sludge with the portion of the crop to be consumed.

(c) Application to pasture land should be done in a manner that avoids contact between the freshly applied sludge and grazing animals raised mainly for milk. Forage and pasture crops should not be consumed by these animals when physically contaminated by freshly applied sludge. Particular attention should be given to avoiding problems with lead, cadmium, and PCB's contaminating the milk through direct ingestion of contaminated sludge.

Although crop quality standards have not been established to date for many contaminants, efforts are underway by FDA to develop such limitations. FDA has, however, provided their recommendations to limit the applications of sludge to land used to grow human or animal foods (Appendix IX).

2-4.3 Project Review. When the project includes application to agricultural land, especially if it involves high application rates (paragraph 2-3.8), or sludges with a high concentration of contaminants (paragraphs 2-2.1 and 2-4.2 and Appendix VII), it may be necessary for the Regional Administrator to consult with USDA and FDA as part of the review process. This is especially true for large agricultural projects.

The review must ensure that all applicable State and Federal regulatory requirements are met. Technical assistance during preparation of the grant application and facility plan development is available from these same agencies as well as the appropriate State offices.

2-4.4. Additional Monitoring Requirements. In addition to the monitoring requirements presented in 2-3.10, baseline sludge analysis should be conducted to serve as a sound basis for setting of application rates, selection of crops and determining other monitoring requirements. Sludges should be characterized in terms of the range of their contaminant concentration including heavy metals (such as cadmium, zinc, molybdenum, copper, nickel, lead, mercury, arsenic and selenium) and persistent organic compounds (such as chlorinated pesticides and PCB's). The sludges should also be analyzed for parameters (such as pH, nitrogen, phosphorus, potassium, and organic content, and possibly calcium and magnesium).

Where products are grown for human consumption on soils, especially to which greater levels of metals or organics have been applied than in this suggested guidance, crop monitoring may be necessary for suspected problem metals, organics, as well as pathogens and parasites.

Records including analyses should be kept by the sludge generating municipality that include sludge quality, locations receiving sludge, annual and total sludge application rates, crops grown and soil pH.

The monitoring plan should be specifically designed for local site conditions and take into account applicable local, State and Federal regulatory requirements by including consideration of sludges, soils, crops, surface water and groundwater quality.

2-4.5. Technical Assistance and Use of Other Sludges. In recognition of the fact that the guidance in the preceding paragraphs is based on limited information, technical assistance for planning and designing land application projects is available from several sources. These include EPA Headquarters and National Environmental Research Centers (especially the Municipal Environmental Research Laboratory in Cincinnati, Ohio), FDA, USDA extension and research elements, State Agricultural Experiment Stations, and other sources (Appendix X).

In addition to municipal sludge, other sludges (e.g., sludges produced by treatment of food processing and brewery wastes) may also be acceptable for land application under carefully defined and controlled practices. Because of the potential benefits to agriculture from sludge application carried out under sound agricultural management conditions, full exploration of this and other beneficial use options is encouraged.

Chapter III

SLUDGE DISPOSAL METHODS

3-1. Sanitary Landfill.

3-1.1. General. Sanitary landfill of sludge, either separately or along with municipal solid waste, is acceptable when supported by an environmental assessment.

3-1.2. Landfill Procedures. A sanitary landfill accepting sludge should be designed and operated in accordance with EPA Guidelines for Land Disposal of Solid Wastes (40 CFR 241 Appendix III). Although it does not directly address landfilling of sewage sludge, specific guidance for the proper design and operation of a sanitary landfill are included in EPA's publication, "Sanitary Landfill Design and Operation" (SW-65ts). Each site should also comply with appropriate criteria and guidelines being developed under P.L. 94-580 for landfilling of sewage sludge. Proposals involving research, development and demonstration of new and innovative landfill technologies should be encouraged and expedited (as discussed for land application technologies in paragraph 2-4.1).

3-1.3 Odor Control. The sanitary landfill must be operated so as to prevent nuisance odors. Normally, the sludge must be stabilized as described for land application (paragraph 2-3.1).

3-1.4 Precautions for Protection of Public Health. Sludge stabilization and the daily soil cover are generally adequate protection from direct health hazards. Additional precautions may be necessary if the public has unrestricted access to the landfill site.

3-1.5. Groundwater Protection. The groundwater underlying the sanitary landfill accepting sludge must be protected and the sanitary landfill must meet applicable State groundwater protection requirements. A geo-hydrologic assessment should be undertaken to determine the adequacy of the site prior to use as a sludge landfill.

3-1.6 Operation. If a sanitary landfill accepting sludge is not operated by the wastewater treatment authority, a binding agreement should be required between the wastewater treatment authority and the operator of the sanitary landfill. Such a binding agreement should include necessary assurances of compliance with the requirements and recommendations of the EPA guidelines (40 CFR 241 Appendix III) and criteria being developed under P.L. 94-580.

3-1.7 Monitoring. A plan should be developed and implemented to provide for adequate monitoring for each sanitary landfill accepting sludge. This plan should be specifically designed to protect groundwater and to ensure protection of surface waters, in the following manner:

a. Groundwater observation wells tested for heavy metals, persistent organics, pathogens, and nitrates;

b. Where the surface water could be affected by direct runoff or leachate from the landfill receiving sludge, surface water monitoring tested for indicators (such as chemical oxygen demands and total dissolved solids). Additional testing may be necessary if it is determined that a poor quality leachate is entering surface waters.

3-2. Incineration.

3-2.1 General. Sludge incineration and disposal of the resulting ash is an environmentally acceptable method for the disposal of sludge when the environmental assessment shows it to be appropriate. Incineration alone is a volume reduction method rather than ultimate disposal. Volume reduction, however, can be an important consideration where land availability is a problem. After incineration, ash, either dry or in scrubber water, remains to be disposed of to the land. Ash disposal must be designed to protect groundwater, to minimize dust production, and to ensure protection of surface waters. Each site should comply with the criteria being developed under P.L. 94-580. Proposals involving research, development and demonstration of new and innovative incineration technologies should be encouraged and expedited (as discussed for land application technologies in paragraph 2-4.1).

Due to the increasing costs and limited availability of energy resources, acceptability and viability of incineration processes is dependent on the ability to recover or reclaim energy from the process. Data available to date indicate that fuel requirements of incineration processes can be reduced by available energy recovery technologies. In some cases, energy recovery can possibly even offset a substantial portion of the energy requirements for the entire wastewater treatment plant. While the basic concepts of energy recovery from incineration of wastes are not new, the application of these concepts to wastewater treatment and sludge management facilities generally require special design considerations. New facilities can be designed from the outset to incorporate the necessary equipment to utilize energy recovered from incineration processes. In existing plants, retrofitting of equipment capable of using recovered energy will be necessary and could be considered to facilitate incineration where cost-effecitve. When energy aspects are addressed in incineration system designs, they should evaluate future as well as current energy conservation and recovery considerations.

3-2.2 Industrial Wastewaters. When introduced into a municipal wastewater treatment works that practices sludge incineration, industrial wastewaters should be pretreated to reduce to a minimum the amounts of mercury, persistent organics, and radioactive materials. In developing pretreatment programs, special attention must be given to the disposal of sludge created or materials removed during the pretreatment process. Disposal of these materials must be in an environmentally sound manner.

3-2.3 Air Quality. The emissions from the sludge incinerator must not result in violation of ambient air quality standards and must meet the EPA air pollution emission standards of performance contained in the New Source Performance Standards for Sludge Incinerators (40 CFR 60.15, Appendix IV). Sewage sludge incinerator discharges into the atmosphere are not to exceed particulate matter at a rate in excess of 0.65 g/kg dry sludge input (1.30 lb/ton dry sludge input) and gases are not to exhibit 20 percent opacity or greater (except where the presence of uncombined water is the only reason for failure to meet the opacity requirement). These emission limits are based on a venturi scrubber, but any similar equipment which meets the standard is acceptable. Sludge incineration is known to vaporize any mercury present in the incoming sludge. EPA has published Amendments to National Emission Standards which do limit mercury emissions from the incineration and drying of wastewater treatment plant sludges to a maximum of 3200 grams per 24 hour period (40 CFR 61.52, included as Appendix V of this document).

3-2.4 Specific Emissions. Tests have shown that sludge incinerator emissions can contain volatilized mercury as well as persistent organic compounds, such as polychlorinated biphenyls, and particulates containing trace amounts of metals such as lead and cadmium. The effect of these compounds which are emitted from the incinerator must be assessed and the sludge should be tested to determine the quantities of compounds present. If the PCB's exceed 25 mg/kg dry sludge, then special measures should be taken to ensure at least 95 percent destruction of persistent organic compounds in incineration. This could consist of testing the performance of an incinerator design to verify satisfactory performance or making allowances in the design. Increased temperature and residence time increase the assurance of destruction.

Regulations being developed under the Toxic Substances Control Act (P.L. 94-469) and the Resource Conservation and Recovery Act (P.L. 94-580) should be consulted regarding current standards for disposal of PCB containing substances. Proposed rules on PCB's disposal under TSCA (P.L. 94-469) were published in the FEDERAL REGISTER on May 24, 1977. Incineration conditions specified therein for materials (PCB mixtures, waste materials, and sludges) that contain 500 ppm or greater of PCB chemical substances (on a dry weight basis) are 1200°C (100°C) for a two second dwell time. While municipal sewage sludges seldom have contamination levels over 500 ppm, final rules promulgated under P.L. 94-469 and those being developed under P.L. 94-580 should be consulted regarding the disposal of PCB containing municipal sewage sludge.

3-2.5 Monitoring. A plan must be developed and implemented to provide for adequate monitoring of each sludge incinerator. The stack gas emissions from sludge incinerators must be monitored to ensure compliance with 40 CFR 60.15 (Appendix IV). In addition, mercury, either in the sludge or in stack gas emissions, must be periodically tested to demonstrate compliance with 40 CFR 61.5 (Appendix V). Wastewater from industrial users must be monitored if it is determined that such users will be a significant source of mercury in the municipal sludge. Additional monitoring for organic pesticides, PCB's or heavy metals other than mercury, may be necessary for specific projects.

3-3. Ocean Disposal.

3-3.1 General. Although approximately 15 percent of the current sludge volume produced in municipal treatment plants is now disposed of into the oceans; the practice of ocean dumping is now being done only under interim ocean dumping permits, because the sludges do not meet existing ocean dumping criteria. Sludge dumping is scheduled to be phased out by the end of 1981.

The Federal Water Pollution Control Act as amended (PL 92-500), and the Marine Protection, Research and Sanctuaries Act of 1972 (PL 92-532) have established a Federal program of marine pollution abatement and control. EPA has issued regulations and criteria (40 CFR 220-227, Appendix VI) to govern the disposal of wastes to the marine environment. EPA controls such disposal by a system of permits for the discharge, transportation, and dumping of all waste materials into the marine environment, except for dredged material which is controlled by the Corps of Engineers, subject to EPA Criteria. Ocean discharge of sludge through outfalls is regulated by EPA under the National Pollutant Discharge Elimination System (NPDES).

3-3.2 Permits. Information available to EPA from permit applications to date indicates that those sludges currently being dumped exceed the criteria and are therefore being dumped under interim permits. One of the conditions of these interim permits is the requirement for an implementation plan to either reduce the toxicity of the materials to meet the criteria or find an alternative method of disposal. Interim permits are granted for one year only and the issuance of new interim

APPENDIX I

Preparation of Environmental Impact Statements

40 CFR 6

PART 6—PREPARATION OF ENVIRONMENTAL IMPACT STATEMENTS

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Authority: Secs. 102, 103 of 83 Stat. 854 (42 U.S.C. 4321 et seq.)

Source: 40 FR 16815, Apr. 14, 1975, unless otherwise noted.

Subpart A—General

§ 6.100 Purpose and policy.

(a) The National Environmental Policy Act (NEPA) of 1969, implemented by Executive Order 11514 and the Council on Environmental Quality's (CEQ's) Guidelines of August 1, 1973 (38 FR 20550), requires that all agencies of the Federal Government prepare detailed environmental impact statements on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment. NEPA requires that agencies include in the decision-making process appropriate and careful consideration of all environmental effects of proposed actions, explain potential environmental effects of proposed actions and their aternatives for public understanding, avoid or minimize adverse effects of proposed actions and restore or enhance environmental quality as much as possible.

(b) This part establishes Environmental Protection Agency (EPA) policy and procedures for the identification and analysis of the environmental impacts of EPA nonregulatory actions and the preparation and processing of environmental impact statements (EIS's) when significant impacts on the environment are anticipated.

§ 6.102 Definitions.

(a) "Environmental assessment" is a written analysis submitted to EPA by its grantees or contractors describing the environmental impacts of proposed actions undertaken with the financial support of EPA. For facilities or section 208 plans as defined in § 6.102 (j) and (k), the assessment must be an integral, though identifiable, part of the plan submitted to EPA for review.

(b) "Environmental review" is a formal evaluation undertaken by EPA to determine whether a proposed EPA action may have a significant impact on the environment. The environmental assessment is one of the major sources of information used in this review.

(c) "Notice of intent" is a memorandum, prepared after the environmental review, announcing to Federal, regional, State, and local agencies, and to interested persons, that a draft EIS will be prepared.

(d) "Environmental impact statement" is a report, prepared by EPA, which identifies and analyzes in detail the environmental impacts of a proposed EPA action and feasible alternatives.

(e) "Negative declaration" is a written announcement, prepared after the environmental review, which states that EPA has decided not to prepare an EIS and summarizes the environmental impact appraisal.

(f) "Environmental impact appraisal" is based on an environmental review and supports a negative declaration. It describes a proposed EPA action, its expected environmental impact, and the basis for the conclusion that no significant impact is anticipated.

(g) "NEPA-associated documents" are any one or combination of: notices of intent, negative declarations, exemption certifications, environmental impact appraisals, news releases, EIS's, and environmental assessments.

(h) "Responsible official" is an Assistant Administrator, Deputy Assistant Administartor, Regional Administrator or their designee.

(i) "Interested persons" are individuals, citizen groups, conservation organizations, corporations, or other nongovernmental units, including applicants for EPA contracts or grants, who may be interested in, affected by, or technically competent to comment on the environmental impacts of the proposed EPA action.

(j) "Section 208 plan" is an areawide waste treatment management plan prepared under section 208 of the Federal Water Pollution Control Act (FWPCA), as amended, under 40 CFR Part 126 and 40 CFR Part 35, Subpart F.

(k) "Facilities plan" is a preliminary plan prepared as the basis for construction of publicly owned waste treatment works under Title II of FWPCA, as amended, under § 35.917 of this chapter.

(l) "Intramural project" is an in-house project undertaken by EPA personnel.

(m) "Extramural project" is a project undertaken by grant or contract.

§ 6.104 Summary of procedures for implementing NEPA.

(a) *Responsible official.* The responsible official shall utilize a systematic, interdisciplinary approach to integrate natural and social sciences as well as environmental design arts in planning programs and making decisions which are subject to NEPA review. His staff may be supplemented by professionals from other agencies, universities or consultants whenever in-house capabilities are insufficiently interdisciplinary.

(b) *Environmental assessment.* Environmental assessments must be submitted to EPA by its grantees and contractors, as required in Subparts E, F, G, and H of this part. The assessment is used by EPA to decide if an EIS is required and to prepare one if necessary.

(c) *Environmental review.* Environmental reviews shall be made of proposed and certain ongoing EPA actions as required in § 6.106(c). This process shall consist of a study of the action to identify and evaluate the environmental impacts of the action. Types of grants, contracts and other actions requiring study are listed in the subparts following Subpart D of this part. The process shall include a review of any environmental assessment received to determine whether any significant impacts are anticipated, whether any changes can be made in the proposed action to eliminate significant adverse impacts, and whether an EIS is required. EPA has overall responsibility for this review, although its grantees and contractors will contribute to the review through their environmental assessments.

(d) *Notice of intent and EIS's.* When an environmental review indicates that a significant environmental impact may occur and the significant adverse impacts cannot be eliminated by making changes in the project, a notice of intent shall be published, and a draft EIS shall be prepared and distributed. After external coordination and evaluation of the comments received, a final EIS shall be prepared and distributed. EIS's should be prepared first on those proposed actions with the most adverse effects which are scheduled for earliest implementation and on other proposed actions according to priorities assigned by the responsible official.

(e) *Negative declaration and environmental impact appraisal.* When the environmental review indicates no significant impacts are anticipated or when the project is changed to eliminate the significant adverse impacts, a negative declaration shall be issued. For the cases in Subparts E, F, G, and H of this part, an environmental impact appraisal shall be prepared which summaries the impacts, alternatives and reasons an EIS was not prepared. It shall remain on file and be available for public inspection.

§ 6.106 Applicability.

(a) *Administrative actions covered.* This part applies to the administrative actions listed below. The subpart referenced with each action lists the detailed NEPA procedures associated with the action. Administrative actions are:

(1) Development of EPA legislative proposals;

(2) Development of favorable reports on legislation initiated elsewhere and not accompanied by an EIS, when they relate to or affect matters within EPA's primary areas of responsibility;

(3) For the programs under Title II of FWPCA, as amended, those administrative actions in § 6.504;

(4) For the Office of Research and Development, those administrative actions in § 6.604;

(5) For the Office of Solid Waste Management Programs, those administrative actions in § 6.702;

(6) For construction of special purpose facilities and facility renovations, those administrative actions in § 6.804; and

(7) Development of an EPA project in conjunction with or located near a project or complex of projects started by one or more Federal agencies when the cumulative effects of all the projects will be major allocations of resources or foreclosures of future land use options.

(b) *Administrative actions excluded.* The requirements of this part do not apply to environmentally protective regulatory activities undertaken by EPA, nor to projects exempted in § 6.504, § 6.604, and § 6.702.

(c) *Application to ongoing actions.* This regulation shall apply to uncompleted and continuing EPA actions initiated before the promulgation of these procedures when modifications of or alternatives to the EPA action are still available, except for the Title II construction grants program. Specific application for the construction grants program is in § 6.504(c). An EIS shall be prepared for each project found to have significant environmental effects as described in § 6.200.

(d) *Application to legislative proposals.* (1) As noted in paragraphs (a) (1) and (2) of this section, EIS's or negative declarations shall be prepared for legislative proposals or favorable reports relating to legislation which may significantly affect the environment. Because of the nature of the legislative process, EIS's for legislation must be prepared and reviewed according to the procedures followed in the development and review of the legislative matter. These procedures are described in Office of Management and Budget (OMB) Circular No. A–19.

(2) A working draft EIS shall be prepared by the EPA office responsible for preparing the legislative proposal or report on legislation. It shall be prepared concurrently with the development of the legislative proposal or report and shall contain the information required in § 6.304. The EIS shall be circulated for internal EPA review with the legislative proposal or report and other supporting documentation. The working draft EIS shall be modified to correspond with changes made in the proposal or report during the internal review. All major alternatives developed during the formulation and review of the proposal or report should be retained in the working draft EIS.

(i) The working draft EIS shall accompany the legislative proposal or report to OMB. EPA shall revise the working draft EIS to respond to comments from OMB and other Federal agencies.

(ii) Upon transmittal of the legislative proposal or report to Congress, the working draft EIS will be forwarded to CEQ and the Congress as a formal legislative EIS. Copies will be distributed according to procedures described in Appendix C.

(iii) Comments received by EPA on the legislative EIS shall be forwarded to the appropriate Congressional Committees. EPA also may respond to specific comments and forward its responses with the comments. Because legislation undergoes continuous changes in Congress beyond the control of EPA, no final EIS need be prepared by EPA.

§ 6.108 Completion of NEPA procedures before starting administrative action.

(a) No administrative action shall be taken until the environmental review process, resulting in an EIS or a negative declaration with environmental appraisal, has been completed.

(b) *When an EIS will be prepared.* Except when requested by the responsible official in writing and approved by CEQ, no administrative action shall be taken sooner than ninety (90) calendar days after a draft EIS has been distributed or sooner than thirty (30) calendar days after the final EIS has been made public. If the final text of an EIS is filed within ninety (90) days after a draft EIS has been circulated for comment, furnished to CEQ and made public, the minimum thirty (30) day period and the ninety (90) day period may run concurrently if they overlap. The minimum periods for review and advance availability of EIS's shall begin on the date CEQ publishes the notice of receipt of the EIS in the FEDERAL REGISTER. In addition, the proposed action should be modified to conform with any changes EPA considers necessary before the final EIS is published.

(c) *When an EIS will not be prepared.* If EPA decides not to prepare an EIS on any action listed in this part for which a negative declaration with environmental appraisal has been prepared, no administrative action shall be taken for at least fifteen (15) working days after the negative declaration is issued to allow public review of the decision. If significant environmental issues are raised during the review period, the decision may be changed and a new environmental appraisal or an EIS may be prepared.

§ 6.110 Responsibilities.

See Appendix B for responsibilities of this part.

Subpart B—Procedures

§ 6.200 Criteria for determining when to prepare an EIS.

The following general criteria shall be used when reviewing a proposed EPA action to determine if it will have a significant impact on the environment and therefore require an EIS:

(a) *Significant environmental effects.* (1) An action with both beneficial and detrimental effects should be classified as having significant effects on the environment, even if EPA believes that the net effect will be beneficial. However, preference should be given to preparing EIS's on proposed actions which, on balance, have adverse effects.

(2) When determining the significance of a proposed action's impacts, the responsible official shall consider both its short term and long term effects as well as its primary and secondary effects as defined in § 6.304(c). Particular attention should be given to changes in land use patterns; changes in energy supply and demand; increased development in floodplains; significant changes in ambient air and water quality or noise levels; potential violations of air quality, water quality and noise level standards; significant changes in surface or groundwater quality or quantity; and encroachments on wetlands, coatstal zones, or fish and wildlife habitat, especially when threatened or endangered species may be affected.

(3) Minor actions which may set a precedent for future major actions with significant adverse impacts or a number of actions with individually insignificant but cumulatively significant adverse impacts shall be classified as having significant environmental impacts. If EPA is taking a number of minor, environmentally insignificant actions that are similar in execution and purpose, during a limited time span and in the same general geographic area, the cumulative environmental impact of all of these actions shall be evaluated.

(4) In determining the significance of a proposed action's impact, the unique characteristics of the project area should be carefully considered. For example, proximity to historic sites, parklands or wild and scenic rivers may make the impact significant. A project discharging into a drinking water aquifier may make the impact significant.

(5) A proposed EPA action which will have direct and significant adverse effects on a property listed in or eligible for listing in the National Register of Historic Places or will cause irreparable loss or destruction of significant scientific, prehistoric, historic or archaeological data shall be classified as having significant environmental impacts.

(b) *Controversial actions.* An EIS shall be prepared when the environmental impact of a proposed EPA action is likely to be highly controversial.

(c) *Additional criteria for specific programs.* Additional criteria for various EPA programs are in Subpart E (Title II Wastewater Treatment Works Construction Grants Program), Subpart F (Research and Development Programs), Subpart G (Solid Waste Management Programs) and Subpart H (Construction of Special Facilities and Facility Renovations).

§ 6.202 Environmental assessment.

Environmental assessments must be submitted to EPA by its grantees and contractors as required in Subparts E, F, G, and H of this part. The assessment is to ensure that the applicant considers the environmental impacts of the proposed action at the earliest possible point in his planning process. The assessment and other relevant information are used by EPA to decide if an EIS is required. While EPA is responsible for ensuring that EIS's are factual and comprehensive, it expects assessments and other data submitted by grantees and contractors to be accurate and complete. The responsible official may request additional data and analyses from grantees or other sources any time he determines they are needed to comply adequately with NEPA.

§ 6.204 Environmental review.

Proposed EPA actions, as well as ongoing EPA actions listed in § 6.106(c), shall be subjected to an environmental review. This review shall be a continuing one, starting at the earliest possible point in the development of the project. It shall consist of a study of the proposed action, including a review of any environmental assessments received, to identify and evaluate the environmental impacts of the proposed action and feasible alternatives. The review will determine whether significant impacts are anticipated from the proposed action, whether any feasible alternatives can be adopted or changes can be made in project design to eliminate significant adverse impacts, and whether an EIS or a negative declaration is required. The responsible official shall determine the proper scope of the environmental review. The responsible official may delay approval of related projects until the proposals can be reviewed together to allow EPA to properly evaluate their cumulative impacts.

§ 6.206 Notice of intent.

(a) *General.* (1) When an environmental review indicates a significant impact may occur and significant adverse impacts cannot be eliminated by making changes in the project, a notice of intent, announcing the preparation of a draft EIS, shall be issued by the responsible official. The notice shall briefly describe the EPA action, its location, and the issues involved (Exhibit 1).

(2) The purpose of a notice of intent is to involve other government agencies and interested persons as early as possible in the planning and evaluation of EPA actions which may have significant environmental impacts. This notice should encourage agency and public input to a draft EIS and assure that environmental values will be identified and weighed from the outset rather than accommodated by adjustments at the end of the decision-making process.

(b) *Specific actions.* The specific actions to be taken by the responsible official on notices of intent are:

(1) When the review process indicates a significant impact may occur and significant adverse impacts cannot be eliminated by making changes in the project, prepare a notice of intent immediately after the environmental review.

(2) Distribute copies of the notice of intent as required in Appendix C.

(3) Publish in a local newspaper, with adequate circulation to cover the area affected by the project, a brief public notice stating that an EIS will be prepared on a particular project, and the public may participate in preparing the EIS (Exhibit 2). News releases also may be submitted to other media.

(c) *Regional office assistance to program offices.* Regional offices will provide assistance to program offices in taking these specific actions when the EIS originates in a program office.

§ 6.208 Draft EIS's.

(a) *General.* (1) The responsible official shall assure that a draft EIS is prepared as soon as possible after the release of the notice of intent. Before releasing the draft EIS to CEQ, a preliminary version may be circulated for review to other offices within EPA with interest in or technical expertise related to the action. Then the draft EIS shall be sent to CEQ and circulated to Federal, State, regional and local agencies with special expertise or jurisdiction by law, and to interested persons. If the responsible official determines that a public hearing on the proposed action is warranted, the hearing will be held after the draft EIS is prepared, according to the requirements of § 6.402.

(2) Draft EIS's should be prepared at the earliest possible point in the project development. If the project involves a grant applicant or potential contractor, he must submit any data EPA requests for preparing the EIS. Where a plan or program has been developed by EPA or submitted to EPA for approval, the relationship between the plan and the later projects encompassed by its shall be evaluated to determine the best time to prepare an EIS. Whenever possible, an EIS will be drafted for the total program at the initial planning stage. Then later component projects included in the plan will not require individual EIS's unless they differ substantially from the plan, or unless the overall plan did not provide enough detail to fully assess significant impacts of individual projects. Plans shall be reevaluated by the responsible official to monitor the cumulative impact of the component projects and to preclude the plans' obsolescence.

(b) *Specific actions.* The specific actions to be taken by the responsible official on draft EIS's are:

(1) Distribute the draft EIS according to the procedures in Appendix C.

(2) Inform the agencies to reply directly to the originating EPA office. Commenting agencies shall have at least forty-five (45) calendar days to reply, starting from the date of publication in the FEDERAL REGISTER of lists of statements received by CEQ. If no comments are received during the reply period and no time extension has been requested, it shall be presumed that the agency has no comment to make. EPA may grant extensions of fifteen (15) or more calendar days. The time limits for review and extensions for State and local agencies; State, regional, and metropolitan clearinghouses; and interested persons shall be the same as those available to Federal agencies.

(3) Publish a notice in local newspapers stating that the draft EIS is available for comment and listing where copies may be obtained (Exhibit 2), and submit news releases to other media.

(4) Include in the draft EIS a notice stating that only those Federal, State, regional, and local agencies and interested persons who make substantive com-

ments on the draft EIS or request a copy of the final EIS will be sent a copy.

(c) *Regional office assistance to program office.* If requested, regional offices will provide assistance to program offices in taking these specific actions when the EIS originates in a program office.

§ 6.210 Final EIS's.

(a) Final EIS's shall respond to all substantive comments raised through the review of the draft EIS. Special care should be taken to respond fully to comments disagreeing with EPA's position. (See also § 6.304(g).)

(b) Distribution and other specific actions are described in Appendix C. If there is an applicant, he shall be sent a copy. When the number of comments on the draft EIS is so large that distribution of the final EIS to all commenting entities appears impractical, the program or regional office preparing the EIS shall consult with OFA, which will consult with CEQ about alternative arrangements for distribution of the EIS.

§ 6.212 Negative declaration and environmental impact appraisals.

(a) *General.* When an environmental review indicates there will be no significant impact or significant adverse impacts have been eliminated by making changes in the project, the responsible official shall prepare a negative declaration to allow public review of his decision before it becomes final. The negative declaration and news release must state that interested persons disagreeing with the decision may submit comments for consideration by EPA. EPA shall not take administrative action on the project for at least fifteen (15) working days after release of the negative declaration and may allow more time for response. The responsible official shall have an environmental impact appraisal supporting the negative declaration available for public review when the negative declaration is released for those cases given in Subparts E, F, G, and H.

(b) *Specific actions.* The responsible official shall take the following specific actions on those projects for which both a negative declaration and an impact appraisal will be prepared:

(1) *Negative declaration.* (i) Prepare a negative declaration immediately after the environmental review. This document shall briefly summarize the purpose of the project, its location, the nature and extent of the land use changes related to the project, and the major primary and secondary impacts of the project. It shall describe how the more detailed environmental impact appraisal may be obtained at cost. (See Exhibit 3.)

(ii) Distribute the negative declaration according to procedures in Appendix C. In addition, submit to local newspapers and other appropriate media a brief news release with a negative declaration attached, informing the public that a decision not to prepare an EIS has been made and a negative declaration and environmental impact appraisal are available for public review and comment (Exhibit 2).

(2) *Environmental impact appraisal.* (i) Prepare an environmental impact appraisal concurrently with the negative declaration. This document shall briefly describe the proposed action and feasible alternatives, environmental impacts of the proposed action, unavoidable adverse impacts of the proposed action, the relationship between short term uses of man's environment and the maintenance and enhancement of long term productivity, steps to minimize harm to the environment, irreversible and irretrievable commitments of resources to implement the action, comments and consultations on the project, and reasons for concluding there will be no significant impacts. (See Exhibit 4.)

(ii) Distribute the environmental impact appraisal according to procedures in Appendix C.

§ 6.214 Additional procedures.

(a) *Historical and archaeological sites.* EPA is subject to the requirements of section 106 of the National Historic Preservation Act of 1966, 16 U.S.C. 470 *et seq.*, Executive Order 11593, the Archaeological and Historic Preservation Act of 1974, 16 U.S.C. 469 *et seq.*, and the regulations promulgated under this legislation. These statutes and regulations establish environmental review procedures which are independent of NEPA requirements.

(1) If an EPA action may affect properties with historic, architectural, archaeological or cultural value which are listed in the National Register of Historic Places (published in the FEDERAL REGISTER each February with supple-

ments on the first Tuesday of each month), the responsible official shall comply with the procedures of the Advisory Council on Historic Preservation (36 CFR Part 800), including determining the need for a Memorandum of Agreement among EPA, the State Historic Preservation Officer and the Advisory Council. If a Memorandum of Agreement is executed, it shall be included in an EIS whenever one is prepared on a proposed action. See § 6.512 (c) of this part for additional procedures for the construction grants program under Title II of the FWPCA, as amended.

(2) If an EPA action may cause irreparable loss or destruction of significant scientific, prehistoric, historic or archaeological data, the responsible official shall consult with the State Historic Preservation Officer in compliance with the Archaeological and Historic Preservation Act (P.L. 93-291).

(b) *Wetlands, floodplains, coastal zones, wild and scenic rivers, fish and wildlife.* The following procedures shall be applied to all EPA administrative actions covered by this part that may affect these environmentally sensitive resources.

(1) If an EPA action may affect wetlands, the responsible official shall consult with the appropriate offices of the Department of the Interior, Department of Commerce, and the U.S. Army Corps of Engineers during the environmental review to determine the probable impact of the action on the pertinent fish and wildlife resources and land use of these areas.

(2) If an EPA action may directly cause or induce the construction of buildings or other facilities in a floodplain, the responsible official shall evaluate flood hazards in connection with these facilities as required by Executive Order 11296 and shall, as far as practicable, consider alternatives to preclude the uneconomic, hazardous or unnecessary use of floodplains to minimize the exposure of facilities to potential flood damage, lessen the need for future Federal expenditures for flood protection and flood disaster relief and preserve the unique and significant public value of the floodplain as an environmental resource.

(3) If an EPA action may affect coastal zones or coastal waters as defined in Title III of the Costal Zone Management Act of 1972 (Pub. L. 92-583), the responsible official shall consult with the appropriate State offices and with the appropriate office of the Department of Commerce during the environmental review to determine the probable impact of the action on coastal zone or coastal water resources.

(4) If an EPA action may affect portions of rivers designated wild and scenic or being considered for this designation under the Wild and Scenic Rivers Act (Pub. L. 90-542), the responsible official shall consult with appropriate State offices and with the Secretary of the Interior or, where national forest lands are involved, with the Secretary of Agriculture during the environmental review to determine the status of an affected river and the probable impact of the action on eligible rivers.

(5) If an EPA action will result in the control or structural modification of any stream or other body of water for any purpose, including navigation and drainage, the responsible official shall consult with the United States Fish and Wildlife Service (Department of the Interior), the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration (Department of Commerce), the U.S. Army Corps of Engineers and the head of the agency administering the wildlife resources of the particular State in which the action will take place with a view to the conservation of wildlife resources. This consultation shall follow the procedures in the Fish and Wildlife Coordination Act (Pub. L. 85-624) and shall occur during the environmental review of an action.

(6) If an EPA action may affect threatened or endangered species defined under section 4 of the Endangered Species Act of 1973 (Pub. L. 93-205), the responsible official shall consult with the Secretary of the Interior or the Secretary of Commerce, according to the procedures in section 7 of that act.

(7) Requests for consultation and the results of consultation shall be documented in writing. In all cases where consultation has occurred, the agencies consulted should receive copies of either the notice of intent and EIS or the negative declaration and environmental appraisal prepared on the proposed action. If a decision has already been made to

prepare an EIS on a project and wetlands, floodplains, coastal zones, wild and scenic rivers, fish or wildlife may be affected, the required consultation may be deferred until the preparation of the draft EIS.

§ 6.216 Availability of documents.

(a) EPA will print copies of draft and final EIS's for agency and public distribution. A nominal fee may be charged for copies requested by the public.

(b) When EPA no longer has copies of an EIS to distribute, copies shall be made available for public inspection at regional and headquarters Offices of Public Affairs. Interested persons also should be advised of the availability (at cost) of the EIS from the Environmental Law Institute, 1356 Connecticut Avenue N.W., Washington, D.C. 20036.

(c) Lists of EIS's prepared or under preparation and lists of negative declarations prepared will be available at both the regional and headquarters Offices of Public Affairs.

Subpart C—Content of Environmental Impact Statements

§ 6.301 Cover sheet.

The cover sheet shall indicate the type of EIS (draft or final), the official project name and number, the responsible EPA office, the date, and the signature of the responsible official. The format is shown in Exhibit 5.

§ 6.302 Summary sheet.

The summary sheet shall conform to the format in Exhibit 6, based on Appendix I of the August 1, 1973, CEQ Guidelines, or the latest revision of the CEQ Guidelines.

§ 6.304 Body of EIS.

The body of the EIS shall identify, develop, and analyze the pertinent issues discussed in the seven sections below; each section need not be a separate chapter. This analysis should include, but not be limited to, consideration of the impacts of the proposed project on the environmental areas listed in Appendix A which are relevant to the project. The EIS shall serve as a means for the responsible official and the public to assess the environmental impacts of a proposed EPA action, rather than as a justification for decisions already made. It shall be prepared using a systematic, interdisciplinary approach and shall incorporate all relevant analytical disciplines to provide meaningful and factual data, information, and analyses. The presentation of data should be clear and concise, yet include all facts necessary to permit independent evaluation and appraisal of the beneficial and adverse environmental effects of alternative actions. The amount of detail provided should be commensurate with the extent and expected impact of the action and the amount of information required at the particular level of decision making. To the extent possible, an EIS shall not be drafted in a style which requires extensive scientific or technical expertise to comprehend and evaluate the environmental impact of a proposed EPA action.

(a) *Background and description of the proposed action.* The EIS shall describe the recommended or proposed action, its purpose, where it is located and its time setting. When a decision has been made not to favor an alternative until public comments on a proposed action have been received, the draft EIS may treat all feasible alternatives at similar levels of detail; the final EIS should focus on the alternative the draft EIS and public comments indicate is the best. The relationship of the proposed action to other projects and proposals directly affected by or stemming from it shall be discussed, including not only other EPA activities, but also those of other governmental and private organizations. Land use patterns and population trends in the project area and the assumptions on which they are based also shall be included. Available maps, photos, and artists' sketches should be incorporated when they help depict the environmental setting.

(b) *Alternatives to the proposed action.* The EIS shall develop, describe, and objectively weigh feasible alternatives to any proposed action, including the options of taking no action or postponing action. The analysis should be detailed enough to show EPA's comparative evaluation of the environmental impacts, commitments of resources, costs, and risks of the proposed action and each feasible alternative. For projects

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involving construction, alternative sites must be analyzed in enough detail for reviewers independently to judge the relative desirability of each site. For alternatives involving regionalization, the effects of varying degrees of regionalization should be addressed. If a cost-benefit analysis is prepared, it should be appended to the EIS and referenced in the body of the EIS. In addition, the reasons why the proposed action is believed by EPA to be the best course of action shall be explained.

(c) *Environmental impacts of the proposed action.* (1) The positive and negative effects of the proposed action as it affects both the national and international environment should be assessed. The attention given to different environmental factors will vary according to the nature, scale, and location of proposed actions. Primary attention should be given to those factors most evidently affected by the proposed action. The factors shall include, where appropriate, the proposed action's effects on the resource base, including land, water quality and quantity, air quality, public services and energy supply. The EIS shall describe primary and secondary environmental impacts, both beneficial and adverse, anticipated from the action. The description shall include short term and long term impacts on both the natural and human environments.

(2) Primary impacts are those that can be attributed directly to the proposed action. If the action is a field experiment, materials introduced into the environment which might damage certain plant communities or wildlife species would be a primary impact. If the action involves construction of a facility, such as a sewage treatment works, an office building or a laboratory, the primary impacts of the action would include the environmental impacts related to construction and operation of the facility and land use changes at the facility site.

(3) Secondary impacts are indirect or induced changes. If the action involves construction of a facility, the secondary impacts would include the environmental impacts related to:

(i) induced changes in the pattern of land use, population density and related effects on air and water quality or other natural resources;

(ii) increased growth at a faster rate than planned for or above the total level planned by the existing community.

(4) A discussion of how socioeconomic activities and land use changes related to the proposed action conform or conflict with the goals and objectives of approved or proposed Federal, regional, State and local land use plans, policies and controls for the project area should be included in the EIS. If a conflict appears to be unresolved in the EIS, EPA should explain why it has decided to proceed without full reconciliation.

(d) *Adverse impacts which cannot be avoided should the proposal be implemented and steps to minimize harm to the environment.* The EIS shall describe the kinds and magnitudes of adverse impacts which cannot be reduced in severity or which can be reduced to an acceptable level but not eliminated. These may include water or air pollution, undesirable land use patterns, damage to fish and wildlife habitats, urban congestion, threats to human health or other consequences adverse to the environmental goals in section 101(b) of NEPA. Protective and mitigative measures to be taken as part of the proposed action shall be identified. These measures to reduce or compensate for any environmentally detrimental aspect of the proposed action may include those of EPA, its contractors and grantees and others involved in the action.

(e) *Relationship betwen local short term uses of man's environment and the maintenance and enhancement of long term productivity.* The EIS shall describe the extent to which the proposed action involves tradeoffs between short term environmental gains at the expense of long term gains or vice-versa and the extent to which the proposed action forecloses future options. Special attention shall be given to effects which narrow the range of future uses of land and water resources or pose long term risks to health or safety. Consideration should be given to windfall gains or significant decreases in current property values from implementing the proposed action. In addition, the reasons the proposed action is believed by EPA to be justified now, rather than reserving a long term option for other alternatives, including no action, shall be explained.

(f) *Irreversible and irretrievable commitments of resources to the proposed action should it be implemented.* The EIS shall describe the extent to which the proposed action requires commitment of construction materials, person-hours and funds to design and implement the project, as well as curtails the range of future uses of land and water resources. For example, induced growth in undeveloped areas may curtail alternative uses of that land. Also, irreversible environmental damage can result from equipment malfunctions or industrial accidents at the project site. Therefore, the need for any irretrievable and significant commitments of resources shall be explained fully.

(g) *Problems and objections raised by other Federal, State and local agencies and by interested persons in the review process.* Final EIS's (and draft EIS's if appropriate) shall summarize the comments and suggestions made by reviewing organizations and shall describe the disposition of issues raised, e.g., revisions to the proposed action to mitigate anticipated impacts or objections. In particular, the EIS shall address the major issues raised when the EPA position differs from most recommendations and explain the factors of overriding importance overruling the adoption of suggestions. Reviewer's statements should be set forth in a "comment" and discussed in a "response." In addition, the source of all comments should be clearly identified, and copies of the comments should be attached to the final EIS. Summaries of comments should be attached when a response has been exceptionally long or the same comments were received from many reviewers.

§ 6.306 Documentation.

All books, research reports, field study reports, correspondence and other documents which provided the data base for evaluating the proposed action and alternatives discussed in the EIS shall be used as references in the body of the EIS and shall be included in a bibliography attached to the EIS.

Subpart D—EPA Public Hearings on EIS's

§ 6.400 General.

While EPA is not required by statute to hold public hearings on EIS's, the responsible official should hold a public hearing on a draft EIS whenever a hearing may facilitate the resolution of conflicts or significant public controversy. This hearing may be in addition to public hearings held on facilities plans or section 209 plans. The responsible official may take special measures to involve interested persons through personal contact.

§ 6.402 Public hearing process.

(a) When public hearings are to be held, EPA shall inform the public of the hearing, for example, with a notice in the draft EIS. The notice should follow the summary sheet at the beginning of the EIS. The draft EIS shall be available for public review at least thirty (30) days before the public hearing. Public notice shall be given at least fifteen (15) working days before the public hearing and shall include:

(1) Publication of a public notice in a newspaper which covers the project area, identifying the project, announcing the date, time and place of the hearing and announcing the availability of detailed information on the proposed action for public inspection at one or more locations in the area in which the project will be located. "Detailed information" shall include a copy of the project application and the draft EIS.

(2) Notification of appropriate State and local agencies and appropriate State, regional and metropolitan clearinghouses.

(3) Notification of interested persons.

(b) A written record of the hearing shall be made. A stenographer may be used to record the hearing. As a minimum, the record shall contain a list of witnesses with the text of each presentation. A summary of the record, including the issues raised, conflicts resolved and unresolved, and any other significant portions of the record, shall be appended to the final EIS.

(c) When a public hearing has been held by another Federal, State, or local agency on an EPA action, additional hearings are not necessary. The responsible official shall decide if additional hearings are needed.

(d) When a program office is the originating office, the appropriate regional office will provide assistance to the originating office in holding any public hearing if assistance is requested.

Subpart E—Guidelines for Compliance With NEPA in the Title II Wastewater Treatment Works Construction Grants Program and the Areawide Waste Treatment Management Planning Program

§ 6.500 Purpose.

This subpart amplifies the general EPA policies and procedures described in Subparts A through D with detailed procedures for compliance with NEPA in the wastewater treatment works construction grants program and the areawide waste treatment management planning program.

§ 6.502 Definitions.

(a) "Step 1 grant." A grant for preparation of a facilities plan as described in § 35.930–1 of this chapter.

(b) "Step 2 grant." A grant for preparation of construction drawings and specifications as described in § 35.930–1 of this chapter.

(c) "Step 3 grant." A grant for fabrication and building of a publicly owned treatment works as described in § 35.930–1 of this chapter.

§ 6.504 Applicability.

(a) *Administrative actions covered.* This subpart applies to the administrative actions listed below:

(1) Approval of all section 208 plans according to procedures in § 35.1067–2 of this chapter;

(2) Approval of all facilities plans except those listed in paragraph (a)(5) of this section;

(3) Award of step 2 and step 3 grants, if an approved facilities plan was not required;

(4) Award of a step 2 or step 3 grant when either the project or its impact has changed significantly from that described in the approved facilities plan, except when the situation in paragraph (a)(5) of this section exists;

(5) Consultation during the NEPA review process. When there are overriding considerations of cost or impaired program effectiveness, the Regional Administrator may award a step 2 or a step 3 grant for a discrete segment of the project plans or construction before the NEPA review is completed if this project segment is noncontroversial. The remaining portion of the project shall be evaluated to determine if an EIS is required. In applying the criteria for this determination, the entire project shall be considered, including those parts permitted to proceed. In no case may these types of step 2 or step 3 grants be awarded unless both the Office of Federal Activities and CEQ have been consulted, a negative declaration has been issued on the segments permitted to proceed, and the grant award contains a specific agreement prohibiting action on the segment of planning or construction for which the NEPA review is not complete. Examples of consultation during the NEPA review process are: award of a step 2 grant for preparation of plans and specifications for a large treatment plant, when the only unresolved NEPA issue is where to locate the sludge disposal site; or award of a step 3 grant for site clearance for a large treatment plant, when the unresolved NEPA issue is whether sludge from the plant should be incinerated at the site or disposed of elsewhere by other means.

(b) *Administrative actions excluded.* The actions listed below are not subject to the requirements of this part:

(1) Approval of State priority lists;

(2) Award of a step 1 grant;

(3) Award of a section 208 planning grant;

(4) Award of a step 2 or step 3 grant when no significant changes in the facilities plan have occurred;

(5) Approval of issuing an invitation for bid or awarding a construction contract;

(6) Actual physical commencement of building or fabrication;

(7) Award of a section 206 grant for reimbursement;

(8) Award of grant increases whenever § 6.504(a)(4) does not apply;

(9) Awards of training assistance under FWPCA, as amended, section 109(b).

(c) *Retroactive application.* The new criteria in § 6.510 of this subpart do not apply to step 2 or step 3 grants awarded before July 1, 1975. However, the Regional Administrator may apply the new criteria of this subpart when he considers it appropriate. Any negative declarations issued before the effective date of this regulation shall remain in effect.

§ 6.506 Completion of NEPA procedures before start of administrative actions.

See § 6.108 and § 6.504.

§ 6.510 Criteria for preparation of environmental impact statements.

In addition to considering the criteria in § 6.200, the Regional Administrator shall assure that an EIS will be prepared on a treatment works facilities plan, 208 plan or other appropriate water quality management plan when:

(a) The treatment works or plan will induce significant changes (either absolute changes or increases in the rate of change) in industrial, commercial, agricultural, or residential land use concentrations or distributions. Factors that should be considered in determining if these changes are significant include but are not limited to: the vacant land subject to increased development pressure as a result of the treatment works; the increases in population which may be induced; the faster rate of change of population; changes in population density; the potential for overloading sewage treatment works; the extent to which landowners may benefit from the areas subject to increased development; the nature of land use regulations in the affected area and their potential effects on development; and deleterious changes in the availability or demand for energy.

(b) Any major part of the treatment works will be located on productive wetlands or will have significant adverse effects on wetlands, including secondary effects.

(c) Any major part of the treatment works will be located on or significantly affect the habitat of wildlife on the Department of Interior's threatened and endangered species lists.

(d) Implementation of the treatment works or plan may directly cause or induce changes that significantly:

(1) Displace population;

(2) Deface an existing residential area; or

(3) Adversely affect significant amounts of prime agricultural land or agricultural operations on this land.

(e) The treatment works or plan will have significant adverse effects on parklands, other public lands or areas of recognized scenic, recreational, archaeological or historic value.

(f) The works or plan may directly or through induced development have a significant adverse effect upon local ambient air quality, local ambient noise levels, surface or groundwater quantity or quality, fish, wildlife, and their natural habitats.

(g) The treated effluent is being discharged into a body of water where the present classification is too lenient or is being challenged as too low to protect present or recent uses, and the effluent will not be of sufficient quality to meet the requirements of these uses.

§ 6.512 Procedures for implementing NEPA.

(a) *Environmental assessment.* An adequate environmental assessment must be an integral, though identifiable, part of any facilities or section 208 plan submitted to EPA. (See § 6.202 for a general description.) The information in the facilities plan, particularly the environmental assessment, will provide the substance of an EIS and shall be submitted by the applicant. The analyses that constitute an adequate environmental assessment shall include:

(1) *Description of the existing environment without the project.* This shall include for the delineated planning area a description of the present environmental conditions relevant to the analysis of alternatives or determinations of the environmental impacts of the proposed action. The description shall include, but not be limited to, discussions of whichever areas are applicable to a particular study: surface and groundwater quality; water supply and use; general hydrology; air quality; noise levels, energy production and consumption; land use trends; population projections, wetlands, floodplains, coastal zones and other environmentally sensitive areas; historic and archaeological sites; other related Federal or State projects in the area; and plant and animal communities which may be affected, especially those containing threatened or endangered species.

(2) *Description of the future environment without the project.* The future environmental conditions with the no project alternative shall be forecast, covering the same areas listed in § 6.512 (a)(1).

(3) *Documentation.* Sources of information used to describe the existing environment and to assess future environmental impacts should be documented. These sources should include regional, State and Federal agencies with responsibility or interest in the types of impacts

listed in § 6.512(a)(1). In particular, the following agencies should be consulted:

(i) Local and regional land use planning agencies for assessments of land use trends and population projections, especially those affecting size, timing, and location of facilities, and planning activities funded under section 701 of the Housing and Community Development Act of 1974 (Pub. L. 93–383);

(ii) The HUD Regional Office if a project involves a flood risk area identified under the Flood Disaster Protection Act of 1973 (Pub. L. 93–234);

(iii) The State coastal zone management agency, if a coastal zone is affected;

(iv) The Secretary of the Interior or Secretary of Agriculture, if a wild and scenic river is affected;

(v) The Secretary of the Interior or Secretary of Commerce, if a threatened or endangered species is affected;

(vi) The Fish and Wildlife Service (Department of Interior), the Department of Commerce, and the U.S. Army Corps of Engineers, if a wetland is affected.

(4) *Evaluation of alternatives.* This discussion shall include a comparative analysis of feasible options and a systematic development of wastewater treatment alternatives. The alternatives shall be screened with respect to capital and operating costs; significant primary and secondary environmental effects; physical, legal or institutional constraints; and whether or not they meet regulatory requirements. Special attention should be given to long term impacts, irreversible impacts and induced impacts such as development. The reasons for rejecting any alternatives shall be presented in addition to any significant environmental benefits precluded by rejection of an alternative. The analysis should consider, when relevant to the project:

(i) Flow and waste reduction measures, including infiltration/inflow reduction;

(ii) Alternative locations, capacities, and construction phasing of facilities;

(iii) Alternative waste management techniques, includigm treatment and discharge, wastewater reuse and land application;

(iv) Alternative methods for disposal of sludge and other residual waste, including process options and final disposal options;

(v) Improving effluent quality through more efficient operation and maintenance;

(vi) For assessments associated with section 208 plans, the analysis of options shall include in addition:

(A) Land use and other regulatory controls, fiscal controls, non-point source controls, and institutional arrangements; and

(B) Land management practices.

(5) *Environmental impacts of the proposed action.* Primary and secondary impacts of the proposed action shall be described, giving special attention to unavoidable impacts, steps to mitigate adverse impacts, any irreversible or irretrievable commitments of resources to the project and the relationship between local short term uses of the environment and the maintenance and enhancement of long term productivity. See § 6.304 (c), (d), (e), and (f) for an explanation of these terms and examples. The significance of land use impacts shall be evaluated, based on current population of the planning area; design year population for the service area; percentage of the service area currently vacant; and plans for staging facilities. Special attention should be given to induced changes in population patterns and growth, particularly if a project involves some degree of regionalization. In addition to these items, the Regional Administrator may require that other analyses and data, which he determines are needed to comply with NEPA, be included with the facilities or section 208 plan. Such requirements should be discussed during preapplication conferences. The Regional Administrator also may require submission of supplementary information either before or after a step 2 grant or before a step 3 grant award if he determines it is needed for compliance with NEPA. Requests for supplementary information shall be made in writing.

(6) *Steps to minimize adverse effects.* This section shall describe structural and nonstructural measures, if any, in the facilities plan to mitigate or eliminate significant adverse effects on the human and natural environments. Structural provisions include changes in facility design, size, and location; nonstructural provisions include staging facilities as well as developing and enforcing land

use regulations and environmentally protective regulations.

(b) *Public hearing.* The applicant shall hold at least one public hearing before a facilities plan is adopted, unless waived by the Regional Administrator before completion of the facilities plan according to § 35.917-5 of the Title II construction grants regulations. Hearings should be held on section 208 plans. A copy of the environmental assessment should be available for public review before the hearing and at the hearing, since these hearings provide an opportunity to accept public input on the environmental issues associated with the facilities plan or the 208 water quality management strategy. In addition, a Regional Administrator may elect to hold an EPA hearing if environmental issues remain unresolved. EPA hearings shall be held according to procedures in § 6.402.

(c) *Environmental review.* An environmental review of a facilities plan or section 208 plan shall be conducted according to the procedures in § 6.204 and applying the criteria of § 6.510. If deficiencies exist in the environmental assessment, they shall be identified in writing by the Regional Administrator and must be corrected before the plan can be approved.

(d) *Additional procedures.* (1) Historic and archaeological sites. If a facilities or section 208 plan may affect properties with historic, architectural, archaeological or cultural value which are listed in or eligible for listing in the National Register of Historic Places or may cause irreparable loss or destruction of significant scientific, prehistoric, historic or archaeological data, the applicant shall follow the procedures in § 6.214(a).

(2) If the facilities or section 208 plan may affect wetlands, floodplains, coastal zones, wild and scenic rivers, fish or wildlife, the Regional Administrator shall follow the appropriate procedures described in § 6.214(b).

(e) *Notice of intent.* The notice of intent on a facilities plan or section 208 plan shall be issued according to § 6.206.

(f) *Scope of EIS.* It is the Regional Administrator's responsibility to determine the scope of the EIS. He should determine if an EIS should be prepared on a facilities plan(s) or section 208 plan and which environmental areas should be discussed in greatest detail in the EIS. Once an EIS has been prepared for the designated section 208 area, another need not be prepared unless the significant impacts of individual facilities or other plan elements were not adequately treated in the EIS. The Regional Administrator should document his decision not to prepare an EIS on individual facilities.

(g) *Negative declaration.* A negative declaration on a facilities plan or section 208 plan shall be prepared according to § 6.212. Once a negative declaration and environmental appraisal have been prepared for the facilities plan for a certain area, grant awards may proceed without preparation of additional negative declarations, unless the project has changed significantly from that described in the facilities plan.

§ 6.514 Content of environmental impact statements.

EIS's for treatment works or plans shall be prepared according to § 6.304.

Subpart F—Guidelines for Compliance With NEPA in Research and Development Programs and Activities

§ 6.600 Purpose.

This subpart amplifies the general EPA policies and procedures described in Subparts A through D by providing procedures for compliance with NEPA on actions undertaken by the Office of Research and Development (ORD).

§ 6.602 Definitions.

(a) "Work plan." A document which defines and schedules all projects required to fulfill the objectives of the program plan.

(b) "Program plan." An overall planning document for a major research area which describes one or more research objectives, including outputs and target completion dates, as well as person-year and dollar resources.

(c) "Appropriate program official." The official at each decision level within ORD to whom the Assistant Administrator delegates responsibility for NEPA compliance.

(d) "Exemption certification." A certified statement delineating those actions specifically exempted from NEPA compliance by existing legislation.

§ 6.604 Applicability.

The requirements of this subpart are applicable to administrative actions undertaken to approve program plans, work plans, and projects, except those plans and projects excluded by existing legislation. However, no administrative actions are excluded from the additonal procedures in § 6.214 of this part concerning historic sites, wetlands, coastal zones, wild and scenic rivers, floodplains or fish and wildlife.

§ 6.608 Criteria for determining when to prepare EIS's.

(a) An EIS shall be prepared by ORD when any of the criteria in § 6.200 apply or when:

(1) The action will have significant adverse impacts on public parks, wetlands, floodplains, coastal zones, wildlife habitats, or areas of recognized scenic or recreational value.

(2) The action will significantly deface an existing residential area.

(3) The action may directly or through induced development have a significant adverse effect upon local ambient air quality, local ambient noise levels, surface or groundwater quality; and fish, wildlife or their natural habitats.

(4) The treated effluent is being discharged into a body of water where the present classification is being challenged as too low to protect present or recent uses, and the effluent will not be of sufficient quality to meet the requirements of these uses.

(5) The project consists of field tests involving the introduction of significant quantities of: toxic or polluting agricultural chemicals, animal wastes, pesticides, radioactive materials, or other hazardous substances into the environment by ORD, its grantees or its contractors.

(6) The action may involve the introduction of species or subspecies not indigenous to an area.

(7) There is a high probability of an action ultimately being implemented on a large scale, and this implementation may result in significant environmental impacts.

(8) The project involves commitment to a new technology which is significant and may restrict future viable alternatives.

(b) An EIS will not usually be needed when:

(1) The project is conducted completely within a laboratory or other facility, and external environmental effects have been minimized by methods for disposal of laboratory wastes and safeguards to prevent hazardous materials entering the environment accidentally; or

(2) The project is a relatively small experiment or investigation that is part of a non-Federally funded activity of the private sector, and it makes no significant new or additional contribution to existing pollution.

§ 6.610 Procedures for compliance with NEPA.

EIS related activities for compliance with NEPA will be integrated into the decision levels of ORD's research planning system to assure managerial control. This control includes those administrative actions which do not come under the applicability of this subpart by assuring that they are made the subject of an exemption certification and filed with the Office of Public Affairs (OPA). ORD's internal procedures provide details for NEPA compliance.

(a) *Environmental assessment.* (1) Environmental assessments shall be submitted with all grant applications and all unsolicited contract proposals. The assessment shall contain the same information required for EIS's in § 6.304. Copies of § 6.304 (or more detailed guidance when available) and a notice of the requirement for assessment shall be included in all grant application kits and attached to letters concerning the submission of unsolicited proposals.

(2) In the case of competitive contracts, assessments need not be submitted by potential contractors since the NEPA procedures must be completed before a request for proposal (RFP) is issued. If there is a question concerning the need for an assessment, the potential contractor should contact the official responsible for the contract.

(b) *Environmental review.* (1) At the start of the planning year, an environmental review will be performed for each program plan with its supporting substructures (work plans and projects) before incorporating them into the ORD program planning system, unless they are excluded from review by existing legislation. This review is an evaluation of the potentially adverse environmental effects of the efforts required by the program plan. The criteria in § 6.608 shall be used in conducting this review. Each program plan with its supporting substructures which does not have significant adverse impacts may be dismissed from further current year environmental considerations with a single negative declaration. Any supporting substructures of a program plan which cannot be dismissed with the parent plan shall be reviewed at the appropriate subordinate levels of the planning system for NEPA compliance.

(i) All continuing program plans and supporting substructures, including those previously dismissed from consideration, will be reevaluted annually for NEPA compliance. An environmental review will coincide with the annual planning cycle and whenever a major redirection of a parent plan is undertaken. All NEPA-associated documents will be updated as appropriate.

(ii) All approved program plans and supporting substructures, less budgetary data, will be filed in the OPA with a notice of intent or negative declaration and environmental appraisal.

(iii) Later plans and/or projects, added to fulfill the mission objectives but not identified at the time the program plans were approved, will be subjected to the same NEPA requirements for environmental assessments and/or reviews.

(iv) Those projects subjected to environmental assessments as outlined in paragraph (a) of this section and not exempt under existing legislation also shall undergo an environmental review before work begins.

(c) *Notice of intent and EIS.*

(1) If the reviews conducted according to paragraph (b) of this section reveal a potentially significant adverse effect on the environment and the adverse impact cannot be eliminated by replanning, the appropriate program official shall, after making sure the project is to be funded, issue a notice of intent according to § 6.206, and through proper organizational channels, shall request the Regional Administrator to assist him in the preparation and distribution of the EIS.

(2) As soon as possible after release of the notice of intent, the appropriate program official shall prepare a draft EIS using the criteria in Subpart B, § 6.208 and Subpart C. Through proper organizational channels, he shall request the Regional Administrator to assist him in the preparation and distribution of the draft EIS.

(3) The appropriate program official shall prepare final EIS's according to criteria in Subpart B, § 6.210 and Subpart C.

(4) All draft and final EIS's shall be sent through the proper organizational channels to the Assistant Administrator for ORD for approval. The approved statements then will be distributed according to the procedures in Appendix C.

(d) *Negative declaration and environmental impact appraisal.* If an environmental review conducted according to paragraph (b) of this section reveals that proposed actions will not have significant adverse environmental impacts, the appropriate program official shall prepare a negative declaration and environmental impact appraisal according to Subpart B, § 6.212. Upon assurance that the program will be funded, the appropriate program official shall distribute the negative declaration as described in § 6.212 and make copies of the negative declaration and appraisal available in the OPA.

(e) *Project start.* As required by § 6.108, a contract or grant shall not be awarded for an extramural project, nor for continuation of what was previously an intramural project, until at least fifteen (15) working days after a negative declaration has been issued or thirty (30) days after forwarding the final EIS to the Council on Environmental Quality.

Subpart G—Guidelines for Compliance With NEPA in Solid Waste Management Activities

§ 6.700 Purpose.

This subpart amplifies the general policies and procedures described in Subparts A through D by providing additional procedures for compliance with NEPA on actions undertaken by the Office of Solid Waste Management Programs (OSWMP).

§ 6.702 Criteria for the preparation of environmental assessments and EIS's.

(a) *Assessment preparation criteria.* An environmental assessment need not be submitted with all grant applications and contract proposals. Studies and investigations do not require assessments. The following sections describe when an assessment is or is not required for other actions:

(1) *Grants.* (i) *Demonstration projects.* Environmental assessments must be submitted with all applications for demonstration grants that will involve construction, land use (temporary or permanent), transport, sea disposal, any discharges into the air or water, or any other activity having any direct or indirect effects on the environment external to the facility in which the work will be conducted. Preapplication proposals for these grants will not require environmental assessments.

(ii) *Training.* Grant applications for training of personnel will not require assessments.

(iii) *Plans.* Grant applications for the development of comprehensive State, interstate, or local solid waste management plans will not require environmental assessments. A detailed analysis of environmental problems and effects should be part of the planning process, however.

(2) *Contracts.* (i) *Sole-source contract proposals.* Before a sole-source contract can be awarded, an environmental assessment must be submitted with a bid proposal for a contract which will involve construction, land use (temporary or permanent), sea disposal, any discharges into the air or water, or any other activity that will directly or indirectly affect the environment external to the facility in which the work will be performed.

(ii) *Competitive contract proposals.* Assessments generally will not be required on competitive contract proposals.

(b) *EIS preparation criteria.* The responsible official shall conduct an environmental review on those OSWMP projects on which an assesment is required or which may have effects on the environment external to the facility in which the work will be performed. The criteria in § 6.200 shall be utilized in determining whether an EIS need be prepared.

§ 6.704 Procedures for compliance with NEPA.

(a) *Environmental assessment.* (1) Environmental assessments shall be submitted to EPA according to procedures in § 6.702. If there is a question concerning the need for an assessment, the potential contractor or grantee should consult with the appropriate project officer for the grant or contract.

(2) The assessment shall contain the same sections specified for EIS's in § 6.304. Copies of § 6.304 (or more detailed guidance when available) and a notice alerting potential grantees and contractors of the assessment requirements in § 6.702 shall be included in all grant application kits, attached to letters concerning the submission of unsolicited proposals, and included with all RFP's.

(b) *Environmental review.* An environmental review will be conducted on all projects which require assessments or which will affect the environment external to the facility in which the work will be performed. This review must be conducted before a grant or contract award is made on an extramural project or before an intramural project begins. The guidelines in § 6.200 will be used to determine if the project will have any significant environmental effects. This review will include an evaluation of the assessment by both the responsible official and the appropriate Regional Administrator. The Regional Administrator's comments will include his recommendations on the need for an EIS. No detailed review or documentation is required on projects for which assessments are not required and which will not affect the environment external to a facility.

(c) *Notice of intent and EIS.* If any of the criteria in § 6.200 apply, the responsible official will assure that a notice of intent and a draft EIS are prepared. The responsible official may request the appropriate Regional Administrator to assist him in the distribution of the NEPA-associated documents. Distribution procedures are listed in Appendix C.

(d) *Negative declaration and environmental impact appraisal.* If the environmental review indicated no significant environmental impacts, the responsible official will assure that a negative declaration and environmental appraisal are prepared. These documents need not be prepared for projects not requiring an environmental review.

(e) The EIS process for the Office of Solid Waste Management Programs is shown graphically in Exhibit 7.

Subpart H—Guidelines for Compliance With NEPA in Construction of Special Purpose Facilities and Facility Renovations

§ 6.800 Purpose.

This subpart amplifies general EPA policies and procedures described in Subparts A through D by providing detailed procedures for the preparation of EIS's on construction and renovation of special purpose facilities.

§ 6.802 Definitions.

(a) *Special purpose facility*. A building or space, including land incidental to its use, which is wholly or predominantly utilized for the special purpose of an agency and not generally suitable for other uses, as determined by the General Services Administration.

(b) *Program of requirements*. A comprehensive document (booklet) describing program activities to be accomplished in the new special purpose facility or improvement. It includes architectural, mechanical, structural, and space requirements.

(c) *Scope of work*. A document similar in content to the program of requirements but substantially abbreviated. It is usually prepared for small-scale projects.

§ 6.804 Applicability.

(a) *Actions covered*. These guidelines apply to all new special purpose facility construction, activities related to this construction (e.g., site acquisition and clearing), and any improvements or modifications to facilities having potential environmental effects external to the facility, including new construction and improvements undertaken and funded by the Facilities Management Branch, Facilities and Support Services Division, Office of Administration; by a regional office; or by a National Environmental Research Center.

(b) *Actions excluded*. This subpart does not apply to those activities of the Facilities Management Branch, Facilities and Support Services Division, for which the branch does not have full fiscal responsibility for the entire project. This includes pilot plant construction, land acquisition, site clearing and access road construction where the Facilities Management Branch's activity is only supporting a project financed by a program office. Responsibility for considering the environmental impacts of such projects rests with the office managing and funding the entire project. Other subparts of this regulation apply depending on the nature of the project.

§ 6.808 Criteria for the preparation of environmental assessments and EIS's.

(a) *Assessment preparation criteria*. The responsible official shall request an environmental assessment from a construction contractor or consulting architect/engineer employed by EPA if he is involved in the planning, construction or modification of special purpose facilities when his activities have potential environmental effects external to the facility. Such modifications include but are not limited to: facility additions, changes in central heating systems or wastewater treatment systems, and land clearing for access roads and parking lots.

(b) *EIS preparation criteria*. The responsible official shall conduct an environmental review of all actions involving construction of special purpose facilities and improvements to these facilities. The guidelines in § 6.200 shall be used to determine whether an EIS shall be prepared.

§ 6.810 Procedures for compliance with NEPA.

(a) *Environmental review and assessment*. (1) An environmental review shall be conducted when the program of requirements or scope of work has been completed for the construction, improvement, or modification of special purpose facilities. For special purpose facility construction, the Chief, Facilities Management Branch, shall request the assistance of the appropriate program office and Regional Administrator in the review. For modifications and improvements, the appropriate responsible official shall request assistance in making the review from other cognizant EPA offices.

(2) Any assessments requested shall contain the same sections listed for EIS's in § 6.304. Contractors and consultants shall be notified in contractual documents when an assessment must be prepared.

(b) *Notice of intent, EIS, and negative declaration*. The responsible official shall decide at the completion of the environmental review whether there may be any significant environmental impacts. If there could be significant environmental impacts, a notice of intent and an EIS shall be prepared according to the procedures in § 6.206. If there may not be any significant environmental impacts, a negative declaration and environmental impact appraisal shall be prepared according to the procedures in § 6.212.

(c) *Project start.* As required by § 6.108, a contract shall not be awarded or construction-related activities begun until at least fifteen (15) working days after release of a negative declaration, or until thirty (30) days after forwarding the final EIS to the Council on Environmental Quality.

EXHIBIT 1

NOTICE OF INTENT TRANSMITTAL MEMORANDUM SUGGESTED FORMAT

(Date)

ENVIRONMENTAL PROTECTION AGENCY

(Appropriate Office)

(Address, City, State, Zip Code)

To All Interested Government Agencies and Public Groups:

As required by guidelines for the preparation of environmental impact statements (EIS's), attached is a notice of intent to prepare an EIS for the proposed EPA action described below:

(Official Project Name and Number)

(City, State)

If your organization needs additional information or wishes to participate in the preparation of the draft EIS, please advise the (appropriate office, city, State).

Very truly yours,

(Appropriate EPA Official)

(List Federal, State, and local agencies to be solicited for comment.)

(List public action groups to be solicited for comment.)

NOTICE OF INTENT SUGGESTED FORMAT

NOTICE OF INTENT—ENVIRONMENTAL PROTECTION AGENCY

1. Project location:
   City --------------------------------
   County ------------------------------
   State -------------------------------
2. Proposed EPA action:

   ----
3. Issues involved:

   ----
4. Estimated project costs:
   Federal Share (total) ------------ $------
   Contract $---- Grant $---- Other $------
   Applicant share (if any):
   (Name) ----------------------$------
   Other (specify) ------------------$------
   Total ----------------------$------
5. Period covered by project:
   Start date: ---------------------------
   (Original date, if project covers more than one year)
   Dates of different project phases: --------
   Approximate end date: -----------------
6. Estimated application filing date: --------

EXHIBIT 2

PUBLIC NOTICE AND NEWS RELEASE SUGGESTED FORMAT

PUBLIC NOTICE

The Environmental Protection Agency (originating office) (will prepare, will not prepare, has prepared) a (draft, final) environmental impact statement on the following project:

(Official Project Name and Number)

(Purpose of Project)

(Project Location, City, County, State)

(Where EIS or negative declaration and environmental impact appraisal can be obtained)

This notice is to implement EPA's policy of encouraging public participation in the decision-making process on proposed EPA actions. Comments on this document may be submitted to (full address of originating office).

EXHIBIT 3

NEGATIVE DECLARATION SUGGESTED FORMAT

(Date)

ENVIRONMENTAL PROTECTION AGENCY

(Appropriate Office)

(Address, City, State, Zip Code)

To All Interested Government Agencies and Public Groups:

As required by guidelines for the preparation of environmental impact statements (EIS's), an environmental review has been performed on the proposed EPA action below:

(Official Project Name and Number)

(Potential Agency Financial Share)

(Project Location: City, County, State)

(Other Funds Included)

PROJECT DESCRIPTION, ORIGINATOR, AND PURPOSE

(Include a map of the project area and a brief narrative summarizing the growth the project will serve, the percent of vacant land the project will serve, major primary and secondary impacts of the project, and the purpose of the project.)

The review process did not indicate significant environmental impacts would result from the proposed action or significant adverse impacts have been eliminated by making changes in the project. Consequently, a preliminary decision not to prepare an EIS has been made.

This action is taken on the basis of a careful review of the engineering report, environmental impact assessment, and other supporting data, which are on file in the above office with the environmental impact appraisal and are available for public scrutiny upon request. Copies of the environmental impact appraisal will be sent at cost on your request.

Comments supporting or disagreeing with this decision may be submitted for consideration by EPA. After evaluating the comments received, the Agency will make a final decision; however, no administrative action will be taken on the project for at least fifteen (15) working days after release of the negative declaration.

Sincerely,

(Appropriate EPA Official)

EXHIBIT 4

ENVIRONMENTAL IMPACT APPRAISAL SUGGESTED FORMAT

A. Identify Project.
Name of Applicant: ------------------
Address: --------------------------
Project Number: --------------------

B. Summarize Assessment.
1. Brief description of project: ----------
----
2. Probable impact of the project on the environment: ------------------------
----

----
3. Any probable adverse environmental effects which cannot be avoided: ----------
----
----
4. Alternatives considered with evaluation of each: -----------------------------
----

----
5. Relationship between local short-term uses of man's environment and maintenance and enhancement of long-term productivity: ----------------------------
----
6. Steps to minimize harm to the environment: ------------------------------
----
7. Any irreversible and irretrievable commitment of resources: -------------------
----
8. Public objections to project, if any, and their resolution: ----------------------
----
9. Agencies consulted about the project: --

State representative's name: ----------
Local representative's name: ----------
Other: ---------------------------

C. Reasons for concluding there will be no significant impacts.

(Signature of appropriate official)
(Date)

EXHIBIT 5

COVER SHEET FORMAT FOR ENVIRONMENTAL IMPACT STATEMENTS

(Draft, Final)

ENVIRONMENTAL IMPACT STATEMENT

(Describe title of project plan and give identifying number)

Prepared by: --------------------------
(Responsible Agency Office)

Approved by: --------------------------
(Responsible Agency Official)

(Date)

EXHIBIT 6

SUMMARY SHEET FORMAT FOR ENVIRONMENTAL IMPACT STATEMENTS

(Check One)
( ) Draft
( ) Final

ENVIRONMENTAL PROTECTION AGENCY

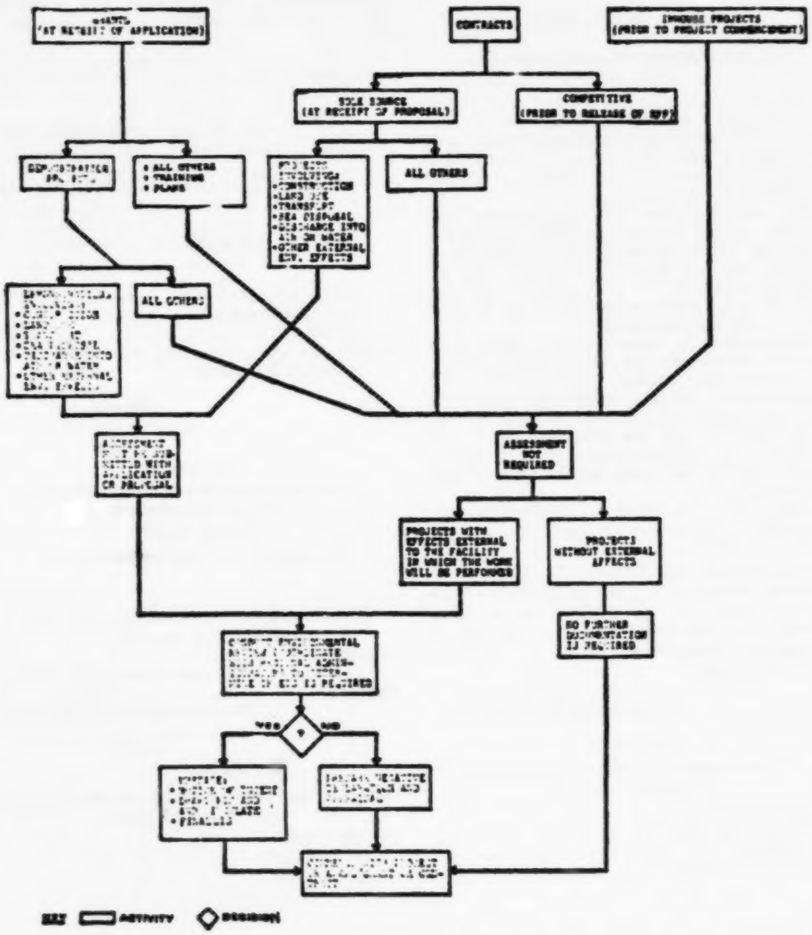
(Responsible Agency Office)

1. Name of action. (Check one)
   ( ) Administrative action.
   ( ) Legislative action.
2. Brief description of action indicating what States (and counties) are particularly affected.
3. Summary of environmental impact and adverse environmental effects.
4. List alternatives considered.
5. a. (for draft statements) List all Federal State, and local agencies and other comments have been requested.
   b. (for final statements) List all Federal Ctate, and local agencies and other sources from which written comments have been received.
6. Dates draft statement and final statement made available to Council on Environmental Quality and public.

EXHIBIT 7

FLOWCHART FOR OSWMP

PROCEDURES FOR DETERMINING IF AN EIS IS REQUIRED ON OSWMP PROJECTS


(AT RECEIPT OF APPLICATION)
CONTRACTS
INHOUSE PROJECTS (PRIOR TO PROJECT COMMENCEMENT)
SOLE SOURCE (AT RECEIPT OF PROPOSAL)
COMPETITIVE (PRIOR TO RELEASE OF RFP)
• ALL OTHERS
• TRAINING
• PLANS
PROJECTS INVOLVING:
• CONSTRUCTION
• LAND USE
• TRANSPORT
• SEA DISPOSAL
• DISCHARGE INTO AIR OR WATER
• OTHER EXTERNAL ENV. EFFECTS
ALL OTHERS
ALL OTHERS
ASSESSMENT MUST BE SUBMITTED WITH APPLICATION OR PROPOSAL
ASSESSMENT NOT REQUIRED
PROJECTS WITH EFFECTS EXTERNAL TO THE FACILITY IN WHICH THE WORK WILL BE PERFORMED
PROJECTS WITHOUT EXTERNAL AFFECTS
NO FURTHER DOCUMENTATION IS REQUIRED
YES
NO
?
KEY
ACTIVITY
DECISION(S)

APPENDIX A

CHECKLIST FOR ENVIRONMENTAL REVIEWS

Areas to be considered, when appropriate, during an environmental review include, but are not limited to, the items on this checklist, based on Appendix II of the CEQ guidelines for the preparation of environmental impact statements which appeared in the FEDERAL REGISTER August 1, 1973. The classification of items is not mandatory.

I. *Natural environment*. Consider the impacts of a proposed action on air quality, water supply and quality, soil conservation and hydrology, fish, and wildlife populations, fish and wildlife habitats, solid waste disposal, noise levels, radiation, and hazardous substances use and disposal.

II. *Land use planning and management*. Consider the impacts of a proposed action on energy supply and natural resources development; protection of environmentally critical areas, such as floodplains, wetlands, beaches and dunes, unstable soils, steep slopes and aquifer recharge areas, coastal area land use; and redevelopment and construction in built-up areas.

III. *Socioeconomic environment*. Consider the impacts of a proposed action on population density changes, congestion mitigation, neighborhood character and cohesion, low income populations, outdoor recreation, industrial/commercial/residential development and tax ratables, and historic, architectural and archaeological preservation.

APPENDIX B

RESPONSIBILITIES

I. *General responsibilities*. (a) *Responsible official*. (1) Requires contractors and grantees to submit environmental assessments and related documents needed to comply with NEPA, and assures environmental reviews are conducted on proposed EPA projects at the earliest possible point in EPA's decision-making process.

(2) When required, assures that draft EIS's are prepared and distributed at the earliest possible point in EPA's decision-making process, their internal and external review is coordinated, and final EIS's are prepared and distributed.

(3) When an EIS is not prepared, assures that negative declarations and environmental appraisals are prepared and distributed for those actions requiring them.

(4) Consults with appropriate officials identified in § 6.214 of this part.

(5) Consults with the Office of Federal Activities on actions involving unresolved conflicts with other Federal agencies.

(b) *Office of Federal Activities*. (1) Provides EPA with policy guidance and assures that EPA offices establish and maintain adequate administrative procedures to comply with this part.

(2) Monitors the overall timeliness and quality of the EPA effort to comply with this part.

(3) Provides assistance to responsible officials as required.

(4) Coordinates the training of personnel involved in the review and preparation of EIS's and other NEPA-associated documents.

(5) Acts as EPA liaison with the Council on Environmental Quality and other Federal and State entities on matters of EPA policy and administrative mechanisms to facilitate external review of EIS's, to determine lead agency and to improve the uniformity of the NEPA procedures of Federal agencies.

(6) Advises the Administrator and Deputy Administrator on projects which involve more than one EPA office, are controversial, are nationally significant, or "pioneer" EPA policy, when these projects have had or should have an EIS prepared on them.

(c) *Office of Public Inquiries*. Assists the Office of Federal Activities and responsible officials by answering the public's queries on the EIS process and on specific EIS's and by directing requests for copies of specific documents to the appropriate regional office or program.

(d) *Office of Public Affairs*. Analyzes the present procedures for public participation, and develops and recommends to the Office of Federal Activities a program to improve those procedures and increase public participation.

(e) *Regional Office Division of Public Affairs*. (1) Assists the responsible official or his designee on matters pertaining to negative declarations, notices of intent, press releases, and other public notification procedures.

(2) Assists the responsible official or his designee by answering the public's queries on the EIS process and on specific EIS's, and by filling requests for copies of specific documents.

(f) *Offices of the Assistant Administrators and Regional Administrators*. (1) Provides specific policy guidance to their respective offices and assures that those offices establish and maintain adequate administrative procedures to comply with this part.

(2) Monitors the overall timeliness and quality of their respective office's efforts to comply with this part.

(3) Acts as liaison between their offices and the Office of Federal Activities and between their offices and other Assistant Administrators or Regional Administrators on matters of agencywide policy and procedures.

(4) Advises the Administrator and Deputy Administrator through the Office of Federal Activities on projects or activities within their respective areas of responsibilities which involve more than one EPA office, are controversial, are nationally significant, or "pioneer" EPA policy, when these projects have had or should have an EIS prepared on them.

(g) *The Office of Legislation*. (1) Provides the necessary liaison with Congress.

(2) Coordinates the preparation of EIS's required on reports on legislation originating outside EPA. (See § 6.106(d)).

(h) *The Office of Planning and Evaluation*. Coordinates the preparation of EIS's required on EPA legislative proposals. (See § 6.106 (d)).

II. *Responsibilities for Title II Construction Grants Program (Subpart E)*. (a) *Responsible official*. The responsible official for EPA actions covered by this subpart is the Regional Administrator. The responsibilities of the Regional Administrator in addition to those in Appendix B.I. are to:

(1) Assist the Office of Federal Activities in coordinating the training of personnel involved in the review and preparation of NEPA-associated documents.

(2) Require grant applicants and those who have submitted plans for approval to provide the information the regional office requires to comply with these guidelines.

(3) Consult with the Office of Federal Activities concerning works or plans which significantly affect more than one regional office, are controversial, are of national significance or "pioneer" EPA policy, when these works have had or should have had an EIS prepared on them.

(b) *Assistant Administrator*. The responsibilities of the Office of the Assistant Administrator, as described in Appendix B.I, shall be assumed by the Assistant Administrator for Water and Hazardous Materials for EPA actions covered by this subpart.

(c) Oil and Special Materials Control Division, Office of Water Program Operations, coordinates all activities and responsibilities of the Office of Water Program Operations concerned with preparation and review of EIS's. This includes providing technical assistance to the Regional Administrators on EIS's and assisting the Office of Federal Activities in coordinating the training of personnel involved in the review and preparation of NEPA-associated documents.

(d) *Public Affairs Division, Regional Offices*. The responsibilities of the regions' Public Affairs Divisions, in addition to those in Appendix B.I, are to:

(1) Assist the Regional Administrator in the preparation and dissemination of NEPA-associated documents.

(2) Collaborate with the Headquarters Office of Public Affairs to analyze procedures in the regions for public participation and to develop and recommend to the Office of Federal Activities a program to improve those procedures.

III. *Responsibilities for Research and Development Programs (Subpart F)*. The Assistant Administrator for Research and Development, in addition to those responsibilities outlined in Appendix B.I(a), will also assume the responsibilities described in Appendix B.I(f).

IV. *Responsibilities for Solid Waste Management Programs (Subpart G)*. (a) *Responsible Official*. The responsible official for EPA actions covered by this subpart is the Deputy Assistant Administrator for Solid Waste Management Programs. The responsibilities of this official, in addition to those in Appendix B.I(a), are to:

(1) Assist the Office of Federal Activities in coordinating the training of personnel involved in the review and preparation of all NEPA-associated documents.

(2) Advise the Assistant Administrator for Air and Waste Management concerning projects which significantly affect more than one regional office, are controversial, are nationally significant, or "pioneer" EPA policy.

V. *Responsibilities for Special Purpose Facilities and Facility Renovation Programs (Subpart H)* —(a) *Responsible official*. The responsible official for new construction and modification of special purpose facilities is as follows:

(1) The Chief, Facilities Management Branch, Data and Support Systems Division, shall be the responsible official on all new construction of special purpose facilities and on all improvement and modification projects for which the Facilities Management Branch has received a funding allowance.

(2) The Regional Administrator shall be the responsible official on all improvement and modification projects for which the regional office has received the funding allowance.

(3) The Center Directors shall be the responsible officials on all improvement and modification projects for which the National Environmental Research Centers have received the funding allowance.

(b) The responsibilities of the responsible officials, in addition to those in Appendix B.I, are to:

(1) Ensure that environmental assessments are submitted when requested, that environmental reviews are conducted on all projects, and EIS's are prepared and circulated when there will be significant impacts.

(2) Assist the Office of Federal Activities in coordinating the training of personnel involved in the review and preparation of NEPA-associated documents.

APPENDIX C

DISTRIBUTION AND AVAILABILITY OF DOCUMENTS

I. *Negative Declaration.* (a) The responsible official shall distribute two copies of each negative declaration to:

(1) The appropriate Federal, State and local agencies and to the appropriate State and areawide clearinghouses.

(2) The Office of Legislation, the Office of Public Affairs and the Office of Federal Activities.

(3) The headquarters EIS coordinator for the program office originating the document. When the originating office is a regional office and the action is related to water quality management, one copy should be forwarded to the Oil and Special Materials Control Division, Office of Water Program Operations.

(b) The responsible official shall distribute one copy of each negative declaration to:

(1) Local newspapers and other local mass media.

(2) *Interested persons on request.* If it is not practical to send copies to all interested persons, make the document available through local libraries or post offices, and notify individuals that this action has been taken.

(c) The responsible official shall have a copy of the negative declaration and any documents supporting the negative declaration available for public review at the originating office.

II. *Environmental Impact Appraisal.* (a) The responsible official shall have the environmental impact appraisal available when the negative declaration is distributed and shall forward one copy to the headquarters EIS coordinator for the program office originating the document and to any other Federal or State agency which requests a copy.

(b) The responsible official shall have a copy of the environmental impact appraisal available for public review at the originating office and shall provide copies at cost to persons who request them.

III. *Notice of Intent.* (a) The responsible official shall forward one copy of the notice of intent to:

(1) The appropriate Federal, State and local agencies and to the appropriate State, regional and metropolitan clearing houses.

(2) Potentially interested persons.

(3) The Offices of Federal Activities, Public Affairs and Legislation.

(4) The headquarters Grants Administration Division, Grants Information Branch.

(5) The headquarters EIS coordinator for the program office originating the notice. When the originating office is a regional office and the action is related to water quality management, one copy should be forwarded to the Oil and Special Materials Control Division, Office of Water Program Operations.

IV. *Draft EIS's.* (a) The responsible official shall send two copies of the draft EIS to;

(1) The Office of Federal Activities.

(2) The headquarters EIS coordinator for the program office originating the document. When the originating office is a regional office and the project is related to water quality management, send two copies to the Oil and Special Materials Control Division, Office of Water Program Operations.

(b) If none of the above offices requests any changes within ten (10) working days after notification, the responsible official shall:

(1) Send five copies of the draft EIS to CEQ.

(2) Send two copies of the draft EIS to the Office of Public Affairs and to the Office of Legislation.

(3) Send two copies of the draft EIS to the appropriate offices of reviewing Federal agencies that have special expertise or jurisdiction by law with respect to any impacts involved. CEQ's guidelines (40 CFR 1500.9 and Appendices II and III) list those agencies to which draft EIS's will be sent for official review and comment.

(4) Send two copies of the draft EIS to the appropriate Federal, State, regional and metropolitan clearinghouses.

(5) Send one copy of the draft EIS to public libraries in the project area and interested persons. Post offices, city halls or courthouses may be used as distribution points if public library facilities are not available.

(c) The responsible official shall make a copy of the draft EIS available for public review at the originating office and at the Office of Public Affairs.

V. *Final EIS.* (a) The responsible official shall distribute the final EIS to the following offices, agencies and interested persons:

(1) Five copies to CEQ.

(2) Two copies to the Office of Public Affairs, Legislation and Federal Activities.

(3) Two copies to the headquarters EIS coordinator for the program office originating the document.

(4) One copy to Federal, State and local agencies and interested persons who made substantive comments on the draft EIS or requested a copy of the final EIS.

(5) One copy to a grant applicant.

(b) The responsible official shall make a copy of the final EIS available for public review at the originating office and at the Office of Public Affairs.

VI. *Legislative EIS.* Copies of the legislative EIS shall be distributed by the responsible official according to the procedures in section IV(b) of this appendix. In addition, the responsible official shall send two copies of the EIS to the Office of Federal Activities and the EIS coordinator of the originating office.

APPENDIX II

Groundwater Extract from:

Alternative Waste Management Techniques
for Best Practicable Waste Treatment
EPA-430/9-75-013, October 1975

Supplement (February 11, 1976)

federal register

WEDNESDAY, FEBRUARY 11, 1976

THE NATIONAL ARCHIVES OF THE UNITED STATES * 1934 *

PART IV:

ENVIRONMENTAL PROTECTION AGENCY

■

ALTERNATIVE WASTE MANAGEMENT TECHNIQUES FOR BEST PRACTICABLE WASTE TREATMENT

Supplement

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ENVIRONMENTAL PROTECTION AGENCY

[FRL 482-6]

ALTERNATIVE WASTE MANAGEMENT TECHNIQUES FOR BEST PRACTICABLE WASTE TREATMENT

Supplement

Pursuant to Section 304(d)(2) of the Federal Water Pollution Control Act Amendments of 1972 (Pub. L. 92–500), the Environmental Protection Agency (EPA), gave notice on October 23, 1975 (40 FR 49598) that Alternative Waste Management Techniques for Best Practicable Waste Treatment has been published in final form. The final report contains the criteria for best practicable waste treatment technology and information on alternative waste management techniques.

The criteria for Best Practicable Waste Treatment for Alternatives employing land application techniques and land utilization practices required that the ground water resulting from land application of wastewater meet the standards for chemical quality [inorganic chemicals] and pesticides [organic chemicals] specified in the EPA Manual for Evaluating Public Drinking Water Supplies in the case of groundwater which potentially can be used for drinking water supply. In addition to the standards for chemical quality and pesticides, the bacteriological standards [microbiological contaminants] specified in the EPA Manual for Evaluating Drinking Water Supplies were required in the case of groundwater which is presently being used as a drinking water supply. The pertinent section of the EPA Manual for Evaluating Public Drinking Water Supplies was included as Appendix D of the Alternative Waste Management Techniques for Best Practicable Waste Treatment report.

Also specified in the Criteria for Best Practicable Waste Treatment is that "any chemical, pesticides, or bacteriological standards for drinking water supply sources hereafter issued by EPA shall automatically apply in lieu of the standards in the EPA Manual for Evaluating Public Drinking Water Supplies. The National Interim Primary Drinking Water Regulations were published in final form on December 24, 1975.

In consideration of the foregoing, Chapter II and Appendix D of Alternative Waste Management Techniques for Best Practicable Waste Treatment shall read as follows.

Dated: February 4, 1976.

Russell E. Train,
Administrator.

Chapter II

CRITERIA FOR BEST PRACTICABLE WASTE TREATMENT

Applicants for construction grant funds authorized by Section 201 of the Act must have evaluated alternative waste treatment management techniques and selected the technique which will provide for the application of best practicable waste treatment technology. Alternatives must be considered in three broad broad categories: treatment and discharge into navigable waters, land application and utilization practices, and reuse of treated wastewater. An alternative is "best practicable" if it is determined to be cost-effective in accordance with the procedures set forth in 40 CFR Part 35 (Appendix B to this document) and if it will meet the criteria set forth below.

(A) Alternatives Employing Treatment and Discharge into Navigable Waters. Publicly-owned treatment works employing treatment and discharge into navigable waters shall, as a minimum, achieve the degree of treatment attainable by the application of secondary treatment as defined in 40 CFR 133 (Appendix C). Requirements for additional treatment, or alternate management techniques, will depend on several factors, including availability of cost-effective technology, cost and the specific characteristics of the affected receiving water body.

(B) Alternatives Employing Land Application Techniques and Land Utilization Practices. Publicly-owned treatment works employing land application techniques and land utilization practices which result in a discharge to navigable waters shall meet the criteria for treatment and discharge under Paragraph (A) above.

The ground water resulting from the land application of wastewater, including the affected native ground water, shall meet the following criteria:

Case 1: The ground water can potentially be used for drinking water supply.

(1) The maximum contaminant levels for inorganic chemicals and organic chemicals specified in the National Interim Primary Drinking Water Regulations (40 CFR 141) (Appendix D) for drinking water supply systems should not be exceeded except as indicated below (see Note 1).

(2) If the existing concentration of a parameter exceeds the maximum contaminant levels for inorganic chemicals or organic chemicals, there should not be an increase in the concentration of that parameter due to land application of wastewater.

Case II: The ground water is used for drinking water supply.

(1) The criteria for Case I should be met.

(2) The maximum microbiological contaminant levels for drinking water supply systems specified in the National Interim Primary Drinking Water Regulations (40 CFR 141) (Appendix D) should not be exceeded in cases where the ground water is used without disinfection (see Note 1).

Case III: Uses other than drinking water supply.

(1) Ground water criteria should be established by the Regional Administrator based on the present or potential use of the ground water.

The Regional Administrator in conjunction with the appropriate State officials and the grantee shall determine on a site-by-site basis the areas in the vicinity of a specific land application site where the criteria in Case I, II, and III shall apply. Specifically determined shall be the monitoring requirements appropriate for the project site. This determination shall be made with the objective of protecting the ground water for use as a drinking water supply and/or other designated uses as appropriate and preventing irrevocable damage to ground water. Requirements shall include provisions for monitoring the effect on the native ground water.

(C) Alternatives Employing Reuse. The total quantity of any pollutant in the effluent from a reuse project which is directly attributable to the effluent from a publicly-owned treatment works shall not exceed that which would have been allowed under Paragraphs (A) and (B) above.

Note 1.—Any amendments of the National Interim Primary Drinking Water Regulations and any National Revised Primary Drinking Water Regulations hereafter issued by EPA prescribing standards for public water system relating to inorganic chemicals, organic chemicals or microbiological contamination shall automatically apply in the same manner as the National Interim Primary Drinking Water Regulations.

Appendix D

GROUND WATER REQUIREMENTS

The following maximum contaminant levels contained in the National Interim Primary Drinking Water Regulations (40 CFR 141) are reprinted for convenience and clarity. The National Interim Primary Drinking Water Regulations were published in final form in the Federal Register on December 24, 1975. In accordance with the criteria for best practicable waste treatment, 40 CFR 141 should be consulted in its entirety when applying the standards contained therein to wastewater treatment systems .employing land appplication techniques and land utilization practices.

Maximum contaminant levels for inorganic chemicals. The following are the maximum levels of inorganic chemicals other than fluoride:

Contaminant:	*Level (milligrams per liter)*
Arsenic	0.05
Barium	1.
Cadmium	0.010
Chromium	0.05
Lead	0.05
Mercury	0.002
Nitrate (as N)	10.
Selenium	0.01
Silver	0.05

The maximum contaminant levels for fluoride are:

Temperature degrees Fahrenheit[1]	Degrees Celsius	Level (milligrams per liter)
53.7 and below	12 apd below	2.4
53.8 to 58.3	12.1 to 14.6	2.2
58.4 to 63.8	14.7 to 17.6	2.0
63.9 to 70.6	17.7 to 21.4	1.8
70.7 to 79.2	21.5 to 26.2	1.6
79.3 to 90.5	26.3 to 32.5	1.4

[1] Annual average of the maximum daily air temperature.

Maximum contaminant levels for organic chemicals. The following are the maximum contaminant levels for organic chemicals:

	Level (milligram per liter)
(a) Chlorinated hydrocarbons:	
Endrin (1,2,3,4,10,10-Hexachloro-6,7 - epoxy - 1,4,4a,5,6,7,8,8a-octahydro-1,4-endo,endo - 5,8-dimethano naphthalene)	0.0002
Lindane (1,2,3,4,5,6 - Hexachlorocyclohexane, gamma isomer)	0.004
Methoxychlor (1,1,1-Trichloro-2, 2-bis [p-methoxyphenyl] ethane)	0.1
Toxaphene ($C_{10}H_{10}Cl_8$ - Technical chlorinated camphene, 67 to 69 percent chlorine)	0.005
(b) Chlorophenoxys:	
2,4-D (2,4-Dichlorophenoxyacetic acid)	0.1
2,4,5-TP Silvex (2,4,5-Trichlorophenoxypropionic acid)	0.01

Maximum microbiological contaminant levels. **The maximum contaminant levels for coliform bacteria, applicable to community water systems and non-community water systems, are as follows:**

(a) When the membrane filter technique pursuant to § 141.21(a) is used, the number of coliform bacteria shall not exceed any of the following:

(1) One per 100 milliliters as the arithmetic mean of all samples examined per month pursuant to § 141.21 (b) or (c);

(2) Four per 100 milliliters in more than one sample when less than 20 are examined per month; or

(3) Four per 100 milliliters in more than five percent of the samples when 20 or more are examined per month.

(b) (1) When the fermentation tube method and 10 milliliter standard portions pursuant to § 141.21(a) are used, coliform bacteria shall not be present in any of the following:

(i) More than 10 percent of the portions in any month pursuant to § 141.21 (b) or (c);

(ii) Three or more portions in more than one sample when less than 20 samples are examined per month; or

(iii) Three or more portions in more than five percent of the samples when 20 or more samples are examined per month.

(2) When the fermentation tube method and 100 milliliter standard portions pursuant to § 141.21(a) are used, coliform bacteria shall not be present in any of the following:

(i) More than 60 percent of the portions in any month pursuant to § 141.21 (b) or (c);

(ii) Five portions in more than one sample when less than five samples are examined per month; or

(iii) Five portions in more than 20 percent of the samples when five or more samples are examined per month.

(c) For community or non-community systems that are required to sample at a rate of less than 4 per month, compliance with Paragraphs (a), (b) (1), or (2) shall be based upon sampling during a 3 month period, except that, at the discretion of the State, compliance may be based upon sampling during a one-month period.

[FR Doc.76-3932 Filed 2-10-76;8:45 am]

APPENDIX III

Guidelines for the Land Disposal of Solid Wastes

40 CFR 241

PART 241—GUIDELINES FOR THE LAND DISPOSAL OF SOLID WASTES

Subpart A—General Provisions

Sec.
241.100 Scope.
241.101 Definitions.

Subpart B—Requirements and Recommended Procedures

Sec.
241.200 Solid wastes accepted.
241.200-1 Requirement.
241.200-2 Recommended procedures: Design.
241.200-3 Recommended procedures: Operations.
241.201 Solid wastes excluded.
241.201-1 Requirement.
241.201-2 Recommended procedures: Design.
241.201-3 Recommended procedures: Operations.
241.202 Site selection.
241.202-1 Requirement.
241.202-2 Recommended procedures: Design.
241.202-3 Recommended procedures: Operations.
241.203 Design.
241.203-1 Requirement.
241.203-2 Recommended procedures: Design.
241.203-3 Recommended procedures: Operations.
241.204 Water quality.
241.204-1 Requirement.
241.204-2 Recommended procedures: Design.
241.204-3 Recommended procedures: Operations.
241.205 Air quality.
241.205-1 Requirement.
241.205-2 Recommended procedures: Design.
241.205-3 Recommended procedures: Operations.
241.206 Gas control.
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241.206-2 Recommended procedures: Design.
241.206-3 Recommended procedures: Operations.
241.207 Vectors.
241.207-1 Requirement.
241.207-2 Recommended procedures: Design.
241.207-3 Recommended procedures: Operations.
241.208 Aesthetics.
241.208-1 Requirement.
241.208-2 Recommended procedures: Design.
241.208-3 Recommended procedures: Operations.
241.209 Cover material.
241.209-1 Requirement.
241.209-2 Recommended procedures: Design.
241.209-3 Recommended procedures: Operations.
241.210 Compaction.
241.210-1 Requirement.
241.210-2 Recommended procedures: Design.
241.210-3 Recommended procedures: Operations.
241.211 Safety.
Sec.
241.211-1 Requirement.
241.211-2 Recommended procedures: Design.
241.211-3 Recommended procedures: Operations.
241.212 Records.
241.212-1 Requirement.
241.212-2 Recommended procedures: Design.
241.212-3 Recommended procedures: Operations.

APPENDIX—Recommended Bibliography.

AUTHORITY: Sec. 209(a) of the Solid Waste Disposal Act of 1965 (Pub. L. 89-272) as amended by the Resource Recovery Act of 1970 (Pub. L. 91-512).

SOURCE: 39 FR 29333, Aug. 14, 1974, unless otherwise noted.

Subpart A—General Provisions

§ 241.100 Scope.

(a) The guidelines are generally applicable to the land disposal of all solid waste materials. However, the guidelines do not apply to hazardous, agricultural, and mining wastes because of the lack of sufficient information upon which to base recommended procedures. Concerning the specific practice of land disposal of milled solid wastes, EPA guidance is contained in a position statement issued in November 1972.

(b) The requirement sections contained herein delineate minimum levels of performance required of any solid waste land disposal site operation. The recommended procedures sections are presented to suggest preferred methods by which the objectives of the requirements can be realized.[1] The recommended procedures are based on the practice of sanitary landfilling municipal solid waste: Normally, residential, and commercial solid waste generated within a community. Sanitary landfilling is the most widely applied environmentally acceptable land disposal method. If techniques other than the recommended procedures are used, or wastes other than municipal solid wastes are disposed, it is the obligation of the proposed facility's owner and operator to demonstrate to the responsible agency in advance by means of engineering calculations and data that the techniques employed will satisfy the requirements.

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[1] Further guidance may be found in the EPA publication, "Sanitary Landfill Design and Operation," which served as a basis for the development of these guidelines.

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(c) Pursuant to section 211 of the Solid Waste Disposal Act, as amended, these guidelines are mandatory for Federal agencies. In addition, they are recommended to State, interstate, regional, and local government agencies for use in their activities.

(d) These guidelines are intended to provide for environmentally acceptable land disposal site operations. The guidelines do not establish new standards but set forth requirements and recommended procedures to ensure that the design, construction, and operation of both existing and future land disposal sites meet the health and environmental standards for the area in which they are located. The guidelines are intended to apply equally to all solid waste generated by Federal agencies, regardless of whether processed or disposed of on or off Federal property; and solid waste generated by non-Federal entities, but processed or disposed of on Federal property. However, in the case of many Federal facilities such as Post Offices, military recruiting stations, and other offices, local community solid waste processing and disposal facilities are utilized, and processing and disposal is not within the management control of the Federal agency. Thus, implementation of the guidelines can be expected only in those situations where the Federal agency is able to exercise direct management control over the processing and disposal operations. However, every effort must be made by the responsible agency, where offsite facilities are utilized, to attain processing and disposal facilities that are in compliance with the guidelines. Where non-Federal generated solid waste is processed and disposed of on Federal land and/or facilities, those facilities and/or sites must be in compliance with these guidelines. Determination of compliance to meet the requirements of the guidelines rests with the responsible agency, and they have the authority to determine how such compliance may occur.

[39 FR 29333, Aug. 14, 1974; 40 FR 5159, Feb. 4, 1975]

§ 241.101 Definitions.

As used in these guidelines:

(a) "Cell" means compacted solid wastes that are enclosed by natural soil or cover material in a land disposal site.

(b) "Cover material" means soil or other suitable material that is used to cover compacted solid wastes in a land disposal site.

(c) "Daily cover" means cover material that is spread and compacted on the top and side slopes of compacted solid waste at least at the end of each operating day in order to control vectors, fire, moisture, and erosion and to assure an aesthetic appearance.

(d) "Final cover" means cover material that serves the same functions as daily cover but, in addition, may be permanently exposed on the surface.

(e) "Free moisture" means liquid that will drain freely by gravity from solid materials.

(f) "Groundwater" means water present in the saturated zone of an aquifer.

(g) "Hazardous wastes" means any waste or combination of wastes which pose a substantial present or potential hazard to human health or living organisms because such wastes are nondegradable or persistent in nature or because they can be biologically magnified, or because they can be lethal, or because they may otherwise cause or tend to cause detrimental cumulative effects.

(h) "Infectious waste" means: (1) Equipment, instruments, utensils, and fomites of a disposable nature from the rooms of patients who are suspected to have or have been diagnosed as having a communicable disease and must, therefore, be isolated as required by public health agencies; (2) laboratory wastes, such as pathological specimens (e.g. all tissues, specimens of blood elements, excreta, and secretions obtained from patients or laboratory animals) and disposable fomites (any substance that may harbor or transmit pathogenic organisms) attendant thereto; (3) surgical operating room pathologic specimens and disposable fomites attendant thereto and similar disposable materials from outpatient areas and emergency rooms.

(i) "Intermediate cover" means cover material that serves the same functions as daily cover, but must resist erosion for a longer period of time, because it is applied on areas where additional cells are not to be constructed for extended periods of time.

(j) "Leachate" means liquid that has percolated through solid waste and has extracted dissolved or suspended materials from it.

(k) "Municipal solid wastes" means normally, residential, and commercial solid waste generated within a community.

(l) "Open burning" means burning of solid wastes in the open, such as in an open dump.

(m) "Open dump" means a land disposal site at which solid wastes are disposed of in a manner that does not protect the environment, is susceptible to open burning, and is exposed to the elements, vectors, and scavengers.

(n) "Plans" means reports and drawings, including a narrative operating description, prepared to describe the land disposal site and its proposed operation.

(o) "Residue" means all the solids that remain after completion of thermal processing, including bottom ash, fly ash, and grate siftings.

(p) "Responsible agency" means the organizational element that has the legal duty to ensure that owners, operators or users of land disposal sites comply with these guidelines.

(q) "Runoff" means the portion of precipitation that drains from an area as surface flow.

(r) "Salvaging" means the controlled removal of waste materials for utilization.

(s) "Sanitary landfill" means a land disposal site employing an engineered method of disposing of solid wastes on land in a manner that minimizes environmental hazards by spreading the solid wastes in thin layers, compacting the solid wastes to the smallest practical volume, and applying and compacting cover material at the end of each operating day.

(t) "Scavenging" means uncontrolled removal of solid waste materials.

(u) "Sludge" means the accumulated semiliquid suspension of settled solids deposited from wastewaters or other fluids in tanks or basins. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants.

(v) "Solid wastes" means garbage, refuse, sludges, and other discarded solid materials resulting from industrial and commercial operations and from community activities. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants.

(w) "Vector" means a carrier, usually an arthropod, that is capable of transmitting a pathogen from one organism to another.

(x) "Water table" means the upper water level of a body of groundwater.

(y) "Working face" means that portion of the land disposal site where solid wastes are discharged and are spread and compacted prior to the placement of cover material.

Subpart B—Requirements and Recommended Procedures

§ 241.200 Solid wastes accepted.

§ 241.200-1 Requirement.

In consultation with the responsible agencies the owner/operator shall determine what wastes shall be accepted and shall identify any special handling required. In general, only wastes for which the facility has been specifically designed shall be accepted; however, other wastes may be accepted if it has been demonstrated to the responsible agency that they can be satisfactorily disposed with the design capability of the facility or after appropriate facility modifications.

§ 241.200-2 Recommended procedures: Design.

The plans should specify the procedures to be employed for wastes requiring special handling.

§ 241.200-3 Recommended procedures: Operations.

(a) Routine sanitary landfill techniques of spreading and compacting solid wastes and placing cover material at the end of each operating day should be used to dispose of municipal solid wastes.

(b) Certain bulky wastes, such as automobile bodies, furniture, and appliances may be salvaged in a controlled manner at a point other than the working face. Otherwise, they should be crushed on solid ground and then pushed onto the working face near the bottom of the cell. Other bulky items, such as demolition and construction debris, tree stumps, and large timbers, should be pushed onto the working face near the bottom of the cell.

(c) Procedures for disposing of dead animals have been established by law in most States, and the operation should comply accordingly. In most cases, small carcasses should be placed on the working face with other municipal solid wastes and covered immediately. In the absence of applicable State laws, large carcasses should be placed in a pit and provided with a cover of compacted soil or other suitable material to encourage runoff of precipitation.

(d) Water treatment plant sludges containing no free moisture and digested or heat treated waste water treatment plant sludges containing no free moisture should be placed on the working face along with municipal solid wastes and covered with soil or municipal solid wastes. The quantities accepted should be determined by operational problems encountered at the working face.

(e) Incinerator and air pollution control residues containing no free moisture should be incorporated into the working face and covered at such intervals as necessary to prevent them from becoming airborne.

§ 241.201 Solid wastes excluded.

§ 241.201–1 Requirement.

Using information supplied by the waste generator/owner, the responsible agency and the disposal site owner/operator shall jointly determine specific wastes to be excluded and shall identify them in the plans. The generator/owner of excluded wastes shall consult with the responsible agency in determining an alternative method of disposal for excluded wastes. The criteria used in considering whether a waste is unacceptable shall include the hydrogeology of the site, the chemical and biological characteristics of the waste, alternative methods available, environmental and health effects, and the safety of personnel. Disposal of pesticides and pesticide containers shall be consistent with the Federal Environmental Pesticides Control Act of 1972 (Pub. L. 92–516) and recommended procedures and regulations promulgated thereunder.

§ 241.201–2 Recommended procedures: Design.

Under certain circumstances it may be necessary to accept special wastes at land disposal sites. The following special wastes require specific approval of the responsible agency for acceptance at the site: Hazardous wastes, infectious institutional wastes, bulk liquids and semi-liquids, sludges containing free moisture, highly flammable or volatile substances, raw animal manure, septic tank pumpings, raw sewage sludge, and certain industrial process wastes. Where the use of the disposal site for such wastes is planned, a special assessment is required of the following items: The site characteristics, nature and quantities of the waste, and special design and operations precautions to be implemented to insure environmentally safe disposal.

§ 241.201–3 Recommended procedures: Operations.

Regular users of the land disposal site should be provided with a list of the materials to be excluded. The list should also be displayed prominently at the site entrance. If a regular user persists in making unacceptable deliveries, he should be barred from the site and reported to the responsible agency.

§ 241.202 Site selection.

§ 241.202–1 Requirement.

Site selection and utilization shall be consistent with public health and welfare, and air and water quality standards and adaptable to appropriate land-use plan.

§ 241.202–2 Recommended procedures: Design.

(a) The hydrogeology of the site should be evaluated in order to design site development in a manner to protect or minimize the impact on groundwater resources. Unacceptable hydrogeologic conditions may be altered to render the site acceptable, but all alterations should be detailed in the plans. Precipitation, evapotranspiration, and other climitological conditions should be considered in site selection and design.

(b) Characteristics of on-site soil should be evaluated with respect to their effects on site operations, such as vehicle maneuverability and use as cover material.

(c) Environmental factors, climatological conditions, and socioeconomic factors should be given full consideration as selection criteria.

(d) The site should be accessible to vehicles which the site is designed to serve by all-weather roads leading from the public road system; temporary roads should be provided as needed to deliver wastes to the working face.

(e) The site should not be located in an area where the attraction of birds would pose a hazard to low-flying aircraft.

§ 241.202-3 Recommended procedures: Operations.

Not Applicable.

§ 241.203 Design

§ 241.203-1 Requirement.

Plans for the design, construction, and operation of new sites or modifications to existing sites shall be prepared or approved by a professional engineer. The plans shall be submitted to the responsible agency for review and, if warranted, approval.

§ 241.203-2 Recommended procedures: Design.

(a) The types and quantities of all solid wastes expected to be disposed of at the facility should be determined by survey and analysis to form a basis for design.

(b) Site development plans should be prepared or approved by a professional engineer and should include: The various design factors addressed elsewhere in the guidelines, as well as:

(1) Initial and final topographies at contour intervals of 5 feet or less.

(2) Land use and zoning within one-quarter mile of the site including location of all residents, buildings, wells, water courses, arroyos, rock outcroppings, roads, and soil or rock borings. All airports within the vicinity of the site should be identified to aid in assessing the potential hazard of birds to aircraft.

(3) Location of all utilities within 500 feet of the site.

(4) Employee convenience and equipment maintenance facilities.

(5) Narrative descriptions, with associated drawings, indicating site development and operation procedures.

(c) Plans should describe the projected use of the completed land disposal site. In addition to maintenance programs and provisions, where necessary, for monitoring and controlling decomposition gases and leachate, the plans should address the following ultimate use criteria:

(1) *Cultivated area*. The major concern if the completed site is to be cultivated is that the integrity of the final cover not be disturbed by agricultural cultivation activities. In this regard, a sufficient depth of cover material to allow cultivation and to support vegetation should be applied in addition to that recommended for final cover.

(2) *Structures*. It is not recommended practice to construct major structures on a completed land disposal site. If major structures are to be built near a completed land disposal site, a professional engineer should approve their design and construction including provision for protection against potential hazards of solid waste decomposition gases.

§ 241.203-3 Recommended procedures: Operations.

Not applicable.

§ 241.204 Water quality.

§ 241.204-1 Requirement.

The location, design, construction, and operation of the land disposal site shall conform to the most stringent of applicable water quality standards established in accordance with or effective under the provisions of the Federal Water Pollution Control Act, as amended. In the absence of such standards, the land disposal site shall be located, designed, constructed and operated in such a manner as to provide adequate protection to ground and surface waters used as drinking water supplies.

§ 241.204-2 Recommended procedures: Design.

(a) Plans should include:

(1) Current and projected use of water resources in the potential zone of influence of the land disposal site.

(2) Groundwater elevation and movement and proposed separation between the lowest point of the lowest cell and the predicted maximum water table elevation.

(3) Potential interrelationship of the land disposal site, local aquifers, and surface waters based on historical records or other sources of information.

(4) Background and initial quality of water resources in the potential zone of influence of the land disposal site.

(5) Proposed location of observation wells, sampling stations, and testing program planned, when appropriate.

(6) Description of soil and other geologic material to a depth adequate to allow evaluation of the water quality protection provided by the soil and other geologic material.

(7) Provision for surface water runoff control to minimize infiltration and erosion of cover material.

(8) Potential of leachate generation and proposed control systems, where nec-

essary, for the protection of ground and surface water resources.

(b) If a land disposal site is located in a flood plain, it should be protected against at least the 50-year design flood by impervious dikes and other appropriate means to prevent the floodwaters from contacting municipal solid waste.

§ 241.204-3 Recommended procedures: Operations.

(a) Surface water courses and runoff should be diverted from the land disposals site (especially from the working face) by means such as trenches, conduits, and proper grading. The land disposal site should be constructed and graded so as to promote rapid surface water runoff without excessive erosion. Regrading should be done as required during construction and after completion to avoid ponding of precipitation and to maintain cover material integrity.

(b) Siltation or retention basins or other approved methods of retarding runoff should be used where necessary to avoid stream siltation or flooding problems due to excessive runoff.

(c) Leachate collection and treatment systems should be used where necessary to protect ground and surface water resources.

(d) Municipal solid wastes and leachate therefrom should not be allowed to contact ground or surface water so as to impair the water's use.

§ 241.205 Air quality.

§ 241.205-1 Requirement.

The design, construction, and operation of the land disposal site shall conform to applicable ambient air quality standards and source control regulations established under the authority of the Clean Air Act, as amended, or State or local standards effective under that Act, if the latter are more stringent.

§ 241.205-2 Recommended procedures: Design.

Plans should include an effective dust control program.

§ 241.205-3 Recommended procedures: Operations.

(a) Open burning of municipal solid waste should be prohibited.

(b) Dust control measures should be initiated as necessary to protect the health and safety of facility personnel, nearby residents, and persons using the facility.

§ 241.206 Gas control.

§ 241.206-1 Requirement.

Decomposition gases generated within the land disposal site shall be controlled on site, as necessary, to avoid posing a hazard to occupants of adjacent property.

§ 241.206-2 Recommended procedures: Design.

Plans should assess the need for gas control and indicate the location and design of any vents, barriers, or other control measures to be provided.

§ 241.206-3 Recommended procedures: Operations.

(a) Decomposition gases should not be allowed to migrate laterally from the land disposal site to endanger occupants of adjacent properties. They should be vented to the atmosphere directly through the cover material, cutoff trenches, or ventilation systems in such a way that they do not accumulate in explosive or toxic concentrations, especially within structures. (Information on the limits of flammability of gases is available in such references as the "Handbook of Chemistry and Physics," 54th ed. CRC Press, Inc., Cleveland, 1973.)

(b) Decomposition gases should not be allowed to concentrate in a manner that will pose an explosion or toxicity hazard.

§ 241.207 Vectors.

§ 241.207-1 Requirement.

Conditions shall be maintained that are unfavorable for the harboring, feeding, and breeding of vectors.

§ 241.207-2 Recommended procedures: Design.

Plans should include contingency programs for vector control, and the operator should be prepared at all times to implement those procedures.

§ 241.207-3 Recommended procedures: Operations.

Vector control contingency programs should be implemented when necessary to prevent or rectify vector problems.

§ 241.208 Aesthetics.

§ 241.208-1 Requirement.

The land disposal site shall be designed and operated at all times in an aesthetically acceptable manner.

§ 241.208–2 Recommended procedures: Design.

Plans should include an effective litter control program.

§ 241.208–3 Recommended procedures: Operations.

(a) Portable litter fences or other devices should be used in the immediate vicinity of the working face and at other appropriate locations to control blowing litter. At the end of each operating day, or more often as required, litter should be removed from the fences and incorporated into the cell being used. Alternatively, the litter may be containerized for disposal on the next operating day.

(b) Wastes that are easily moved by wind should be covered, as necessary, to prevent their becoming airborne and scattered.

(c) On-site vegetation should be cleared only as necessary. Natural windbreaks, such as green belts, should be maintained where they will improve the appearance and operation of the land disposal site. Buffer strips should be planted and/or berms constructed as necessary to screen the working force from nearby residences or major roadways.

(d) Salvage operations should be conducted in such a manner as to not detract from the appearance of the land disposal site. Salvaged material should be removed from the land disposal site frequently enough to maintain aesthetic acceptability.

§ 241.209 Cover material.

§ 241.209–1 Requirement.

Cover material shall be applied as necessary to minimize fire hazards, infiltration of precipitation, odors, and blowing litter; control gas venting and vectors; discourage scavenging; and provide a pleasing appearance.

§ 241.209–2 Recommended procedures: Design.

Plans should specify:

(a) Cover material sources and soil classifications (Unified Soil Classification System or U.S. Department of Agriculture Classification System).

(b) Surface grades and side slopes needed to promote maximum runoff, without excessive erosion, to minimize infiltration.

(c) Procedures to promote vegetative growth as promptly as possible to combat erosion and improve appearance of idle and completed areas.

(d) Procedures to maintain cover material integrity, e.g., regarding and recovering.

§ 241.209–3 Recommended procedures: Operations.

(a) Daily cover should be applied regardless of weather; sources of cover material should, therefore, be accessible on all operating days. The thickness of the compacted daily cover should not be less than 6 inches.

(b) Intermediate cover should be applied on areas where additional cells are not to be constructed for extended periods of time; normally, one week to one year. The thickness of the compacted intermediate cover should not be less than 1 foot.

(c) Final cover should be applied on each area as it is completed or if the area is to remain idle for over one year. The thickness of the compacted final cover should not be less than 2 feet.

§ 241.210 Compaction.

§ 241.210–1 Requirement.

In order to conserve land disposal site capacity, thereby preserving land resources, and to minimize moisture infiltration and settlement, municipal solid waste and cover material shall be compacted to the smallest practicable volume.

§ 241.210–2 Recommended procedures: Design.

(a) Arrangements should be made and indicated in the plans whereby substitute equipment will be available to provide uninterrupted service during routine equipment maintenance periods or equipment breakdowns.

(b) An equipment maintenance facility should be provided onsite, or appropriate contract arrangements should be made to receive such service.

(c) Equipment manuals, catalogs, and spare parts lists should be compiled and readily available onsite.

§ 241.210–3 Recommended procedures: Operations.

(a) Municipal solid waste handling equipment should on any operating day be capable of performing the following functions:

(1) Spread the solid waste accepted in layers no more than 2 feet thick while confining it to the smallest practicable area;

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(2) Compact the spread solid wastes to the smallest practicable volume (several such compacted layers will form a cell); and

(3) Place, spread, and compact the cover material over the cell at least by the end of each day's operation.

(b) A preventive maintenance program should be employed to maintain equipment in operating order.

(c) An operating manual describing the various tasks that must be performed during a typical shift should be available to employees for reference.

§ 241.211 Safety.

§ 241.211–1 Requirement.

The land disposal site shall be designed, constructed, and operated in such a manner as to protect the health and safety of personnel associated with the operation. Pertinent provisions of the Occupational Safety and Health Act of 1970 (Pub. L. 91–596) and regulation promulgated thereunder shall apply.

§ 241.211–2 Recommended procedures: Design.

A manual describing safety precautions and procedures to be employed should be developed.

§ 241.211–3 Recommended procedures: Operations.

(a) A safety manual should be available for use by employees, and they should be instructed in application of its procedures.

(b) Personal safety devices such as hard hats, gloves, safety glasses, and footwear should be provided to facility employees.

(c) Safety devices, including but not limited to such items as rollover protective structures, seatbelts, audible reverse warning devices, and fire exinguishers should be provided on all equipment used to spread and compact solid wastes or cover material at the facility.

(d) Provisions should be made to extinguish any fires in wastes being delivered to the site or which occur at the working face or within equipment or personnel facilities.

(e) Communications equipment should be available on site for emergency situations.

(f) Scavenging should be prohibited at all times to avoid injury and to prevent interference with site operations.

(g) Access to the site should be controlled and should be by established roadways only. The site should be accessible only when operating personnel are on duty. Large containers may be placed at the site entrance so that users can conveniently deposit waste after hours. The containers and the areas around them should be maintained in a sanitary and litter-free condition.

(h) Traffic signs or markers should be provided to promote an orderly traffic pattern to and from the discharge area, maintain efficient operating conditions, and, if necessary, restrict access to hazardous areas. Drivers of manually discharging vehicles should not hinder operation of mechanically discharging vehicles. Vehicles should not be left unattended at the working face or along traffic routes. If a regular user persistently poses a safety hazard, he should be barred from the site and reported to the responsible agency.

§ 241.212 Records.

§ 241.212–1 Requirement.

The owner/operator of the land disposal site shall maintain records and monitoring data to be provided, as required, to the responsible agency.

§ 241.212–2 Recommended procedures: Design.

Where appropriate, plans should prescribe methods to be used in maintaining records and monitoring the environmental impact of the land disposal site. Information on recording and monitoring requirements should be obtained from the responsible agency.

§ 241.212–3 Recommended procedures: Operations.

(a) Records should be maintained covering at least the following:

(1) Major operational problems, complaints, or difficulties.

(2) Qualitative and quantitative evaluation of the environmental impact of the land disposal site, with regard to the effectiveness of gas and leachate control, including results of: (i) Leachate sampling and analyses; (ii) gas sampling and analyses; (iii) ground and surface water quality sampling and analyses upstream and downstream of the site.

(3) Vector control efforts.

(4) Dust and litter control efforts.

(5) Quantitative measurements of the solid wastes handled. This should be accomplished through routine or periodic utilization of scales and topographic surveys of the site.

(6) Description of solid waste materials received, identified by source of materials.

(b) Upon completion of the site, a detailed description, including a plat, should be recorded with the area's land recording authority. The description should include general types and locations of wastes, depth of fill, and other information of interest to potential landowners.

APPENDIX—RECOMMENDED BIBLIOGRAPHY

1. Banta, J., ET AL. Sanitary landfill; manual of engineering practices, No. 39. American Society of Civil Engineers, 1959.

2. Black, C. A., D. D. Evans, J. L. White, L. E. Ensminger, F. E. Clark, and R. C. Dinauer, EDS. Methods of soil analysis. Pt. 1. Physical and mineralogical properties, including statistics of measurement and sampling. Madison, Wis., American Society of Agronomy, Inc., 1965.

3. Black, R. J. Sanitary landfill . . . an answer to a community problem: a route to a community asset. Public Health Service Publication No. 1012. Washington, U.S. Government Printing Office, 1970. [8 p.].

4. Bjornson, B. F., H. D. Pratt, and K. S. Littig. Control of domestic rats & mice. Public Health Service Publication No. 563. Washington, U.S. Government Printing Office, 1956. Revised 1960, 1968. Reprinted [Bureau of Solid Waste Management] 1970. 41 p.

5. Brashares, W. C., and R. M. Golden. Occupational Safety and Health Act. Special bulletin. Washington, National Solid Wastes Management Association, 1972.

6. Brunner, D. R., S. J. Hubbard, D. J. Keller, and J. L. Newton. Closing open dumps. Washington, U.S. Government Printing Office, 1971. 19 p. Reprinted 1972.

7. Brunner, D. R., and D. J. Keller, Sanitary landfill design and operation. Washington, U.S. Government Printing Office, 1972. 59 p.

8. Sorg, T. J., and H. L. Hickman, Jr. Sanitary landfill facts. 2d ed. Public Health Service Publication No. 1792. Washington, U.S. Government Printing Office, 1970. 30 p. Reprinted 1971.

9. Occupational Safety and Health Act of 1970; Public Law 91–596, 91st Cong., S. 2193, Dec. 29, 1970. Washington, U.S. Government Printing Office, 1970.

10. The Solid Waste Disposal Act as amended; Title II of Public Law 89–272, 89th Cong., S. 306, Oct. 20, 1965; Public Law 91–512, 91st Cong., H.R. 11833, Oct. 26, 1970. Washington, U.S. Government Printing Office, 1971. 14 p. Reprinted 1972.

11. Zausner, E. R. An accounting system for sanitary landfill operations. Public Health Service Publication No. 2007. Washington, U.S. Government Printing Office, 1969. 18 p.

12. Federal Environment Pesticides Control Act of 1972; Public Law 92–516, 92d Cong., H.R. 10729, Oct. 21, 1972. Washington, U.S. Government Printing Office, 1972.

13. Handbook of chemistry and physics. 54th ed., Cleveland, CRC Press, Inc., 1973.

APPENDIX IV

Standards of Performance for New Stationary Sources; Subpart O - Standards of Performance for Sewage Treatment Plants

40 CFR 60.150

and proposed amendment

PART 60—STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

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Subpart O—Standards of Performance for Sewage Treatment Plants

60.150 Applicability and designation of affected facility.
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Appendix A—Reference Methods

AUTHORITY: Secs. 111, 114, Pub. L. 91-604 (42 U.S.C. 1857(c)(6) and (9)).

SOURCE: The provisions of this Part 60 appear at 36 F.R. 24877, Dec. 23, 1971, unless otherwise noted.

Subpart O—Standards of Performance for Sewage Treatment Plants

SOURCE: 39 FR 9319, Mar. 8, 1974, unless otherwise noted.

§ 60.150 Applicability and designation of affected facility.

The affected facility to which the provisions of this subpart apply is each incinerator which burns the sludge produced by municipal sewage treatment facilities.

§ 60.151 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in subpart A of this part.

§ 60.152 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator of any sewage sludge incinerator subject to the provisions of this subpart shall discharge or cause the discharge into the atmosphere of:

(1) Particulate matter at a rate in excess of 0.65 g/kg dry sludge input (1.30 lb/ton dry sludge input).

(2) Any gases which exhibit 20 percent opacity or greater. Where the presence of uncombined water is the only reason for failure to meet the requirements of this paragraph, such failure shall not be a violation of this section.

§ 60.153 Monitoring of operations.

(a) The owner or operator of any sludge incinerator subject to the provisions of this subpart shall:

(1) Install, calibrate, maintain, and operate a flow measuring device which can be used to determine either the mass or volume of sludge charged to the incinerator. The flow measuring device shall have an accuracy of ±5 percent over its operating range.

(2) Provide access to the sludge charged so that a well-mixed representative grab sample of the sludge can be obtained.

§ 60.154 Test methods and procedures.

(a) The reference methods appended to this part, except as provided for in § 60.8(b), shall be used to determine compliance with the standards prescribed in § 60.152 as follows:

(1) Method 5 for concentration of particulate matter and associated moisture content,

(2) Method 1 for sample and velocity traverses,

(3) Method 2 for volumetric flow rate, and

(4) Method 3 for gas analysis.

(b) For Method 5, the sampling time for each run shall be at least 60 minutes and the sampling rate shall be at least 0.015 dscm/min (0.53 dscf/min), except that shorter sampling times, when necessitated by process variables or other factors, may be approved by the Administrator.

(c) Dry sludge charging rate shall be determined as follows:

(1) Determine the mass (S_M) or volume (S_V) of sludge charged to the incinerator during each run using a flow measuring device meeting the requirements of § 60.153(a)(1). If total input during a run is measured by a flow measuring device, such readings shall be used. Otherwise, record the flow measuring device readings at 5-minute intervals during a run. Determine the quantity charged during each interval by averaging the flow rates at the beginning and end of the interval and then multiplying the average for each interval by the time for each interval. Then add the quantity for each interval to determine the total quantity charged during the entire run, (S_M) or (S_V).

(2) Collect samples of the sludge charged to the incinerator in non-porous collecting jars at the beginning of each run and at approximately 1-hour intervals thereafter until the test ends, and determine for each sample the dry sludge content (total solids residue) in accordance with "224 G. Method for Solid and Semisolid Samples," *Standard Methods for the Examination of Water and Wastewater*, Thirteenth Edition, American Public Health Association, Inc., New York, N.Y., 1971, pp. 539–41, except that:

(i) Evaporating dishes shall be ignited to at least 103°C rather than the 550°C specified in step 3(a)(1).

(ii) Determination of volatile residue, step 3(b) may be deleted.

(iii) The quantity of dry sludge per unit sludge charged shall be determined in terms of either R_{DV} (metric units: mg dry sludge/liter sludge charged or English units: lb/ft³) or R_{DM} (metric units: mg dry sludge/mg sludge charged or English units: lb/lb).

(3) Determine the quantity of dry sludge per unit sludge charged in terms of either R_{DV} or R_{DM}.

(i) If the volume of sludge charged is used:

$$S_D = (60 \times 10^{-3}) \frac{R_{DV} S_V}{T} \text{ (Metric Units)}$$

or

$$S_D = (8.021) \frac{R_{DV} S_V}{T} \text{ (English Units)}$$

where:

S_D = average dry sludge charging rate during the run, kg/hr (English units: lb/hr).
R_{DV} = average quantity of dry sludge per unit volume of sludge charged to the incinerator, mg/l (English units: lb/ft³).
S_V = sludge charged to the incinerator during the run, m³ (English units: gal).
T = duration of run, min (English units: min).
60×10^{-3} = metric units conversion factor, 1-kg-min/m³-mg-hr.
8.021 = English units conversion factor, ft³-min/gal-hr.

(ii) If the mass of sludge charged is used:

$$S_D = (60) \frac{R_{DM} S_M}{T} \text{ (Metric or English Units)}$$

where:

S_D = average dry sludge charging rate during the run, kg/hr (English units: lb/hr).
R_{DM} = average ratio of quantity of dry sludge to quantity of sludge charged to the incinerator, mg/mg (English units: lb/lb).
S_M = sludge charged during the run, kg (English units: lb).
T = duration of run, min (Metric or English units).
60 = conversion factor, min/hr (Metric or English units).

(d) Particulate emission rate shall be determined by:

$$C_{aw} = C_s Q_s \text{ (Metric or English Units)}$$

where:

C_{aw} = particulate matter mass emissions, mg/hr (English units: lb/hr).
C_s = particulate matter concentration, mg/m³ (English units: lb/dscf).
Q_s = volumetric stack gas flow rate, dscm/hr (English units: dscf/hr). Q_s and C_s shall be determined using Methods 2 and 5, respectively.

(e) Compliance with § 60.152(a) shall be determined as follows:

$$C_{ds} = (10^{-3}) \frac{C_{aw}}{S_D} \text{ (Metric Units)}$$

or

$$C_{ds} = (2000) \frac{C_{aw}}{S_D} \text{ (English Units)}$$

where:

C_{ds} = particulate emission discharge, g/kg dry sludge (English units: lb/ton dry sludge).
10^{-3} = Metric conversion factor, g/mg.
2000 = English conversion factor, lb/ton.

[39 FR 9319, Mar. 8, 1974; 39 FR 13776, Apr. 17, 1974; 39 FR 15396, May 3, 1974]

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ENVIRONMENTAL PROTECTION AGENCY

[FRL 639-1]

[40 CFR Part 60]

STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

Sewage Sludge Incinerators

Subpart 0 sets forth standards of performance for new, modified, and reconstructed sewage sludge incinerators in sewage treatment plants. The standards limit emissions of particulate matter to [illegible] kg dry sludge input (1.30 lb/ton [illegible] sludge input) and visible emissions to 20 percent opacity. The State of Alaska recently requested EPA to revise § 60.150 of the regulation. The basis of the request is that incinerators which are small enough to meet the needs of small communities in Alaska and also comply with the particulate matter standard are not available, and the disposal of sewage sludge in landfills is not a viable option because of permafrost and other factors resulting in landfill problems (shallow and soft landfills). The proposed amendment would exempt incinerators with a capacity of less than 140 kg/hr (300 lb/hr) dry sludge provided that disposal by land application or sanitary landfill are shown to be infeasible because of freezing conditions.

BACKGROUND

The standards of performance for sewage sludge incinerators were promulgated March 8, 1974 (39 FR 9308), under section 111 of the Clean Air Act. Section 111 directs the Administrator to establish standards of performance for new stationary sources which reflect the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction) the Administrator determines has been adequately demonstrated. The best system of emission reduction for sewage sludge incinerators (multiple hearth and fluid bed reactor type incinerators) was determined to be low energy venturi scrubbers.

At the time the standards were promulgated EPA was developing a standard for mercury emissions from sewage sludge incinerators and guidelines for municipal sludge management. The standard limiting mercury emissions was promulgated under section 112 (Hazardous Air Pollutants) of the Clean Air Act on October 14, 1975 (40 FR 48302), and the proposed guideline was issued for public comment on June 3, 1976, under the title "Technical Bulletin on Municipal Sludge Management: Environmental Factors."

Incineration is just one of several methods available for sludge disposal. The standards, which limit emissions of mercury and particulate matter, insure that adequate emission control systems are employed when incineration is used as the method of sludge disposal. Incineration is only a volume reduction method. After incineration, the ash, either dry or in scrubber water, remains to be disposed of to the land. Ash disposal must be designed to protect ground water, to prevent dust, and to insure no erosion to surface waters.

INVESTIGATION

In investigating Alaska's request, EPA contacted the vendors of sewage sludge incinerators and found that multiple hearth or fluid bed reactor type incinerators which can achieve the particulate matter standard are not commercially available below a size capacity of 140 kg/hr (300 lb/hr). This means that incineration would not be a disposal option where units smaller than 140 kg/hr are needed. Since the unique problems in parts of Alaska also prevent disposal by land application or sanitary landfill, sludge disposal cannot be accomplished in an environmentally acceptable mnaner under existing regulations. EPA concluded that a revision to the standards of performance for sludge incinerators is appropriate.

In developing a revision to the standard to accommodate the unique problems in parts of Alaska, EPA intends that the proposed exemption not create an incentive to utilize small incinerators which would not be covered under the standard. To avoid this situation the proposed exemption applies only where an owner or operator can demonstrate to the satisfaction of the Administrator that land application and sanitary landfills are not feasible disposal methods for the sewage sludge. The size exemption is based on the capacity of the waste water treatment plant rather than the incinerator in order to prevent constructing multiple small incinerators rather than larger units which would be subject to the standard.

The proposed amendment of § 60.150 would not affect applicable national mercury emission standards under § 61.50 which currently regulates mercury emissions from all sludge incinerators. These standards are not subject to the exemption because control of mercury emissions can be achieved by ordinances or statutes which prevent mercury-bearing material from being introduced into the municipal waste treatment system.

PUBLIC PARTICIPATION

Interested persons may participate in this proposed rulemaking by submitting written comments (in triplicate) to the Emission Standards and Engineering Division, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, Attention: Mr. Don R. Goodwin. Comments on all aspects of the proposed revision are welcome. All relevant comments received not later than March 15, 1977 will be considered. Comments received will be available for public inspection and copying at the EPA Public Information Reference Unit, Room 2922 (EPA Library), 401 M Street, S.W., Washington, D.C. 20460.

AUTHORITY: Sections 111, 114, and 301(a) of the Clean Air Act, as amended by sec. 4(a) of Pub. L. 91-604, 84 Stat. 1678 and by sec. 15(c)(2) of Pub. L. 91-604, 84 Stat. 1713 [42 U.S.C. 1857c-6, 1857c-9 and 1857g(a)].

Dated: January 14, 1977.

RUSSELL E. TRAIN,
Administrator.

In 40 CFR Part 60, it is proposed to amend Subpart 0, by revising § 60.150 as follows:

§ 60.150 Applicability and designation of affected facility.

(a) The affected facility to which the provisions of this subpart apply is each incinerator which combusts the sludge produced by municipal sewage treatment plants except as provided under paragraph (b) of this section.

(b) The owner or operator of a sewage sludge incinerator may apply to the Administrator for an exemption to the requirements of this subpart for any sewage sludge incinerator that is in a municipal waste treatment plant having a dry sludge capacity below 140 kg/hr (300 lb/hr). The Administrator will grant an exemption provided the owner or operator demonstrates to the Administrator's satisfaction that it is not feasible to dispose of the sludge by land application or in a sanitary landfill because of freezing conditions. For the purpose of determining the capacity of a municipal waste treatment plant under this paragraph, the dry sludge capacity of the municipal waste treatment plant or the dry sludge capacity of the sewage sludge incinerator, whichever is greater, is used.

[FR Doc.77-2384 Filed 1-25-77;8:45 am]

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APPENDIX V

National Emission Standards for Hazardous Air Pollutants; Subpart E - National Emission Standard for Mercury

40 CFR 61.50

PART 61—NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

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Subpart E—National Emission Standard for Mercury

61.50 Applicability.
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61.53 Stack sampling.
61.54 Sludge sampling.
61.55 Emission monitoring.

Appendix A—Compliance Status Information.
Appendix B—Test Methods.
Method 101—Reference method for determination of particulate and gaseous mercury emissions from stationary sources (air streams).
Method 102—Reference method for determination of particulate and gaseous mercury emissions from stationary sources (hydrogen streams).
Method 103—Beryllium screening method.
Method 104—Reference method for determination of beryllium emissions from stationary sources.
Method 105—Method for determination of mercury in wastewater treatment plant sewage sludges.

AUTHORITY: Secs. 112 and 114 of the Clean Air Act, as amended by sec. 4(a) of Pub. L. 91–604, 84 Stat. 1678 (42 U.S.C. 1857c–7, 1857 c–9).

SOURCE: 38 FR 8826, Apr. 6, 1973, unless otherwise noted.

Subpart E—National Emission Standard for Mercury

§ 61.50 Applicability.

The provisions of this subpart are applicable to those stationary sources which process mercury ore to recover mercury, use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide, and incinerate or dry wastewater treatment plant sludge

[40 FR 48302, Oct. 14, 1975]

§ 61.51 Definitions.

Terms used in this subpart are defined in the act, in Subpart A of this part, or in this section as follows:

(a) "Mercury" means the element mercury, excluding any associated elements, and includes mercury in particulates, vapors, aerosols, and compounds.

(b) "Mercury ore" means a mineral mined specifically for its mercury content.

(c) "Mercury ore processing facility" means a facility processing mercury ore to obtain mercury.

(d) "Condenser stack gases" mean the gaseous effluent evolved from the stack of processes utilizing heat to extract mercury metal from mercury ore.

(e) "Mercury chlor-alkali cell" means a device which is basically composed of an electrolyzer section and a denuder (decomposer) section and utilizes mercury to produce chlorine gas, hydrogen gas, and alkali metal hydroxide.

(f) "Mercury chlor-alkali electrolyzer" means an electrolytic device which is part of a mercury chlor-alkali cell and utilizes a flowing mercury cathode to produce chlorine gas and alkali metal amalgam.

(g) "Denuder" means a horizontal or vertical container which is part of a mercury chlor-alkali cell and in which water and alkali metal amalgam are converted to alkali metal hydroxide, mercury, and hydrogen gas in a short-circuited, electrolytic reaction.

(h) "Hydrogen gas stream" means a hydrogen stream formed in the chlor-alkali cell denuder.

(i) "End box" means a container(s) located on one or both ends of a mercury chlor-alkali electrolyzer which serves as a connection between the electrolyzer and denuder for rich and stripped amalgam.

(j) "End box ventilation system" means a ventilation system which collects mercury emissions from the end-boxes, the mercury pump sumps, and their water colection systems.

(k) "Cell room" means a structure(s) housing one or more mercury electrolytic chlor-alkali cells.

(l) "Sludge" means sludge produced by a treatment plant that processes municipal or industrial waste waters.

(m) "Sludge dryer" means a device used to reduce the moisture content of sludge by heating to temperatures above 65°C (ca. 150°F) directly with combustion gases.

[38 FR 8826, Apr. 6, 1973, as amended at 40 FR 48302, Oct. 14, 1975]

§ 61.52 Emission standard.

(a) Emissions to the atmosphere from mercury ore processing facilities and mercury cell chlor-alkali plants shall not exceed 2300 grams of mercury per 24-hour period.

(b) Emissions to the atmosphere from sludge incineration plants, sludge drying plants, or a combination of these that process wastewater treatment plant sludges shall not exceed 3200 grams of mercury per 24-hour period.

[40 FR 48302, Oct. 14, 1975]

§ 61.53 Stack sampling.

(a) Mercury ore processing facility.

(1) Unless a waiver of emission testing is obtained under § 61.13, each owner or operator processing mercury ore shall test emissions from his source.

(i) Within 90 days of the effective date in the case of an existing source or a new source which has an initial startup date preceding the effective date; or

(ii) Within 90 days of startup in the case of a new source which did not have an initial startup date preceding the effective date.

(2) The Administrator shall be notified at least 30 days prior to an emission test, so that he may at his option observe the test.

(3) Samples shall be taken over such a period or periods as are necessary to accurately determine the maximum emissions which will occur in a 24-hour period. No changes in the operation shall be made, which would potentially increase emissions above that determined by the most recent source test, until the new emission level has been estimated by calculation and the results reported to the Administrator.

(4) All samples shall be analyzed, and mercury emissions shall be determined within 30 days after the source test. Each determination will be reported to the Administrator by a registered letter dispatched before the close of the next business day following such determination.

(5) Records of emission test results and other data needed to determine total emissions shall be retained at the source and made available for inspection by the Administrator, for a minimum of 2 years.

(b) Mercury chlor-alkali plant—hydrogen and end-box ventilation gas streams.

(1) Unless a waiver of emission testing is obtained under § 61.13, each owner or operator employing mercury chlor-alkali cell(s) shall test emissions from his source,

(i) Within 90 days of the effective date in the case of an existing source or a new source which has an initial startup date preceding the effective date; or

(ii) Within 90 days of startup in the case of a new source which did not have an initial startup date preceding the effective date.

(2) The Administrator shall be notified at least 30 days prior to an emission test, so that he may at his option observe the test.

(3) Samples shall be taken over such a period or periods as are necessary to accurately determine the maximum emissions which will occur in a 24-hour period. No changes in the operation shall be made, which would potentially increase emissions above that determined by the most recent source test, until the new emission has been estimated by calculation and the results reported to the Administrator.

(4) All samples shall be analyzed and mercury emisions shall be determined within 30 days after the source test. All the determinations will be reported to the Administrator by a registered letter dispatched before the close of the next business day following such determination.

(5) Records of emission test results and other data needed to determine total emissions shall be retained at the source and made available, for inspection by the Administrator, for a minimum of 2 years.

(c) Mercury chlor-alkali plants—cell room ventilation system.

(1) Stationary sources using mercury chlor-alkali cells may test cell room emissions in accordance with paragraph (c)(2) of this section or demonstrate compliance with paragraph (c)(4) of this section and assume ventilation emissions of 1,300 gms/day of mercury.

(2) Unless a waiver of emission testing is obtained under § 61.13, each owner or operator shall pass all cell room air in forced gas streams through stacks suitable for testing.

(i) Within 90 days of the effective date in the case of an existing source or a new source which has an initial startup date preceding the effective date; or

(ii) Within 90 days of startup in the case of a new source which did not have an initial startup date preceding the effective date.

(3) The Administrator shall be notified at least 30 days prior to an emission test, so that he may at his option observe the test.

(4) An owner or operator may carry out approved design, maintenance, and housekeeping practices. A list of approved design, maintenance, and housekeeping practices may be obtained from the Administrator.

(d) Sludge incineration and drying plants.

(1) Unless a waiver of emission testing is obtained under § 61.13, each owner or operator of a source subject to the standard in § 61.52(b) shall test emissions from that source. Such tests shall be conducted in accordance with the procedures set forth either in paragraph (d) of this section or in § 61.54.

(2) Method 101 in Appendix B to this part shall be used to test emissions as follows:

(i) The test shall be performed within 90 days of the effective date of these regulations in the case of an existing source or a new source which has an initial startup date preceding the effective date.

(ii) The test shall be performed within 90 days of startup in the case of a new source which did not have an initial startup date preceding the effective date.

(3) The Administrator shall be notified at least 30 days prior to an emission test, so that he may at his option observe the test.

(4) Samples shall be taken over such a period or periods as are necessary to determine accurately the maximum emissions which will occur in a 24-hour period. No changes shall be made in the operation which would potentially increase emissions above the level determined by the most recent stack test, until the new emission level has been estimated by calculation and the results reported to the Administrator.

(5) All samples shall be analyzed, and mercury emissions shall be determined within 30 days after the stack test. Each determination shall be reported to the Administrator by a registered letter dispatched before the close of the next business day following such determination.

(6) Records of emission test results and other data needed to determine total

emissions shall be retained at the source and shall be made available, for inspection by the Administrator, for a minimum of 2 years.

[38 FR 8826, Apr. 6, 1973, as amended at 40 FR 48302, Oct. 14, 1975]

§ 61.54 Sludge sampling.

(a) As an alternative means for demonstrating compliance with § 61.52 (b), an owner or operator may use Method 105 of Appendix B and the procedures specified in this section.

(1) A sludge test shall be conducted within 90 days of the effective date of these regulations in the case of an existing source or a new source which has an initial startup date preceding the effective date; or

(2) A sludge test shall be conducted within 90 days of startup in the case of a new source which did not have an initial startup date preceding the effective date.

(b) The Administrator shall be notified at least 30 days prior to a sludge sampling test, so that he may at his option observe the test.

(c) Sludge shall be sampled according to paragraph (c)(1) of this section, sludge charging rate for the plant shall be determined according to paragraph (c)(2) of this section, and the sludge analysis shall be performed according to paragraph (c)(3) of this section.

(1) The sludge shall be sampled after dewatering and before incineration or drying, at a location that provides a representative sample of the sludge that is charged to the incinerator or dryer. Eight consecutive grab samples shall be obtained at intervals of between 45 and 60 minutes and thoroughly mixed into one sample. Each of the eight grab samples shall have a volume of at least 200 ml but not more than 400 ml. A total of three composite samples shall be obtained within an operating period of 24 hours. When the 24-hour operating period is not continuous, the total sampling period shall not exceed 72 hours after the first grab sample is obtained. Samples shall not be exposed to any condition that may result in mercury contamination or loss.

(2) The maximum 24-hour period sludge incineration or drying rate shall be determined by use of a flow rate measurement device that can measure the mass rate of sludge charged to the incinerator or dryer with an accuracy of ±5 percent over its operating range. Other methods of measuring sludge mass charging rates may be used if they have received prior approval by the Administrator.

(3) The handling, preparation, and analysis of sludge samples shall be accomplished according to Method 105 in Appendix B of this part.

(d) The mercury emissions shall be determined by use of the following equation:

$$E_{Hg}=1 \times 10^{-3}\, cQ$$

where

E_{Hg}=Mercury emissions, g/day.
c =Mercury concentration of sludge on a dry solids basis, μg/g (ppm).
Q =Sludge charging rate, kg/day.

(e) No changes in the operation of a plant shall be made after a sludge test has been conducted which would potentially increase emissions above the level determined by the most recent sludge test, until the new emission level has been estimated by calculation and the results reported to the Administrator.

(f) All sludge samples shall be analyzed for mercury content within 30 days after the sludge sample is collected. Each determination shall be reported to the Administrator by a registered letter dispatched before the close of the next business day following such determination.

(g) Records of sludge sampling, charging rate determination and other data needed to determine mercury content of wastewater treatment plant sludges shall be retained at the source and made available, for inspection by the Administrator, for a minimum of 2 years.

[40 FR 48303, Oct. 14, 1975]

§ 61.55 Emission monitoring.

(a) Wastewater treatment plant sludge incineration and drying plants. All such sources for which mercury emissions exceed 1600 g/day, demonstrated either by stack sampling according to § 61.53 or sludge sampling according to § 61.54, shall monitor mercury emissions at intervals of at least once per year by use of Method 105 of Appendix B, or the procedures specified in § 61.54(c) and (d). The results of monitoring shall be reported and retained according to § 61.53(d) (5) and (6), or § 61.54(f) and (g).

[40 FR 48303, Oct. 14, 1975]

APPENDIX B—TEST METHODS

METHOD 105—METHOD FOR DETERMINATION OF MERCURY IN WASTEWATER TREATMENT PLANT SEWAGE SLUDGES

1. *Principle and applicability*. 1.1 Principle—A weighed portion of the sewage sludge sample is digested in aqua regia for 2 minutes at 95°C, followed by oxidation with potassium permanganate. Mercury in the digested sample is then measured by the conventional spectrophotometer cold vapor technique. An alternative digestion involving the use of an autoclave is described in paragraph 4.5.2 of this method.

1.2 Applicability—This method is applicable for the determination of total organic and inorganic mercury content in sewage sludges, soils, sediments, and bottom-type materials. The normal range of this method is 0.2 to 5 µg/g. The range may be extended above or below the normal range by increasing or decreasing sample size and through instrument and recorder control.

2. *Apparatus*. 2.1 Analysis—The conventional cold vapor technique(5) is used to analyze the sample.

2.1.1 Atomic Absorption Spectrophotometer[1]—Any atomic absorption unit having an open sample presentation area in which to mount the absorption cell is suitable. Instrument settings recommended by the particular manufacturer should be followed.

2.1.2 Mercury Hollow Cathode Lamp—Westinghouse WL-22847, argon filled, or equivalent.

2.1.3 Recorder—Any multirange, variable-speed recorder that is compatible with the UV detection system is suitable.

2.1.4 Absorption Cell—Standard spectrophotometer cells 10 cm long, having quartz end windows may be used. Suitable cells may be constructed from plexiglass tubing, 2.5 cm O.D. x 11.4 cm (ca. 1" O.D. x 4¼"). The ends are ground perpendicular to the longitudinal axis, and quartz windows [2.5 cm diameter x 0.16 cm thickness (ca. 1" diameter x 1/16" thickness)] are cemented in place. Gas inlet and outlet ports [also of plexiglass but 0.6 cm O.D. (ca. ¼" O.D.)] are attached approximately 1.3 cm (½") from each end. The cell is strapped to a burner for support and aligned in the light beam to give the maximum transmittance. NOTE: Two 5.1 cm x 5.1 cm (ca. 2" x 2") cards with 2.5 cm (ca. 1") diameter holes may be placed over each end of the cell to assist in positioning the cell for maximum transmittance.

2.1.5 Air Pump—Any peristaltic pump capable of delivering 1 liter of air per minute may be used. A Masterflex pump with electronic speed control has been found to be satisfactory. (Regulated compressed air can be used in an open one-pass system.)

2.1.6 Flowmeter—Capable of measuring an air flow of 1 liter per minute.

2.1.7 Aeration Tubing—Tygon tubing is used for passage of the mercury vapor from the sample bottle to the absorption cell and return. Straight glass tubing terminating in a coarse porous frit is used for sparging air into the sample.

2.1.8 Drying Tube—15 cm long x 1.9 cm diameter (ca. 6" long x ¾" diameter) tube containing 20 grams of the desiccant magnesium perchlorate. The apparatus is assembled as shown in Figure 105-1. In place of the magnesium perchlorate drying tube, a small reading lamp with 60W bulb may be used to prevent condensation of moisture inside the cell. The lamp is positioned so as not to interfere with the measurement and to shine on the absorption cell maintaining the air temperature about 5°C above ambient.

3. *Reagents*. 3.1 Analysis.

3.1.1 Aqua Regia—Prepare immediately before use by carefully adding three volumes of concentrated HCl to one volume of concentrated HNO_3.

3.1.2 Sulfuric Acid, 0.5N—Dilute 14.0 ml of concentrated sulfuric acid to 1.0 liter.

3.1.3 Stannous Sulfate—Add 25 g stannous sulfate to 250 ml of 0.5N sulfuric acid. This mixture is a suspension and should be stirred continuously during use. Stannous chloride may be used in place of the stannous sulfate.

3.1.4 Sodium Chloride—Hydroxylamine Sulfate Solution—Dissolve 12 grams of sodium chloride and 12 grams of hydroxylamine sulfate in distilled water and dilute to 100 ml. Hydroxylamine hydrochloride may be used in place of the hydroxylamine sulfate.

3.1.5 Potassium Permanganate—5% solution w/v. Dissolve 5 grams of potassium permanganate in 100 ml of distilled water.

3.1.6 Stock Mercury Solution—Dissolve 0.1354 grams of reagent grade mercuric chloride (Assay >95%) in 75 ml of distilled water. Add 10 ml of concentrated nitric acid and adjust the volume to 100.0 ml. 1 ml=1 mg Hg.

3.1.7 Working Mercury Solution—Make successive dilutions of the stock mercury solution to obtain a working standard containing 0.1 µg per ml. This working standard and the dilutions of the stock mercury solution should be prepared fresh daily. Acidity of the working standard should be maintained at 0.15% nitric acid. This acid should be added to the flask as needed before the addition of the aliquot. Mercuric solutions should not be prepared in plastic containers.

4. *Procedures*. Samples for mercury analysis are subject to contamination from a variety of sources. Extreme care must be taken to prevent contamination. Certain interferences may occur during the analysis procedures. Extreme caution must be taken to avoid inhalation of mercury.

4.1 Sample Handling and Preservation.

4.1.1 Because of the extreme sensitivity of the analytical procedure and the omnipresence of mercury, care must be taken to avoid extraneous contamination. Sampling devices, sample containers, and reagents should be ascertained to be free of significant amounts of mercury; the sample should not be exposed to any condition in the laboratory that may result in contact or airborne mercury contamination. Sample containers to be used for collection and shipment of mercury samples should be properly cleaned before use. These should be rinsed with at least 20% v/v HNO_3 followed by distilled water.

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[1] Instruments designed specifically for the measurement of mercury using the cold vapor technique are commercially available and may be substituted for the atomic absorption spectrophotometer.

4.1.2 While the sample may be analyzed without drying, it has been found to be more convenient to analyze a dry sample. Moisture may be driven off in a drying oven at a temperature of 60°C. No significant mercury losses have been observed by using this drying step. The dry sample should be pulverized and thoroughly mixed before the aliquot is weighed.

4.2 Interferences.

4.2.1 Interferences that may occur in sludge samples are sulfides, high copper, high chlorides, etc. A discussion of possible interferences and suggested preventative measures to be taken is given in Reference (6) (7).

4.2.2 Volatile materials which absorb at the 253.7 nm will cause a positive interference. In order to remove any interfering volatile materials, the dead air space in the BOD bottle should be purged with nitrogen before the addition of stannous sulfate.

4.3 Handling Sample Mercury Vapors After Analysis.

4.3.1 Because of the toxic nature of mercury vapor, precaution must be taken to avoid its inhalation. Therefore, a bypass should be included in the analysis system to either vent the mercury vapor into an exhaust hood or pass the vapor through some absorbing media, such as:

(a) equal volumes of 0.1N $KMNO_4$ and 10% H_2SO_4;

(b) 0.25% iodine in a 3% KI solution.

A specially treated charcoal that will absorb mercury vapor is also available from Barneby and Cheney, E. 8th Ave. and North Cassidy St., Columbus, Ohio 43219, Catalog No. 580-13 or No. 580-22.[3]

4.4 Calibration.

4.4.1 Transfer 0, 0.5, 1.0, 2.0, 5.0 and 10 ml aliquots of the working mercury solution containing 0 to 1.0 μg of mercury to a series of 300-ml BOD bottles. Add enough distilled water to each bottle to make a total volume of 10 ml. Add 5 ml of aqua regia and heat 2 minutes in a water bath at 95°C. Allow the sample to cool and add 50 ml distilled water and 15 ml of $KMnO_4$ solution to each bottle and return to the water bath for 30 minutes. Cool and add 6 ml of sodium chloride-hydroxylamine sulfate solution to reduce the excess permanganate. Add 50 ml of distilled water. Treating each bottle individually, add 5 ml of stannous sulfate solution and immediately attach the bottle to the aeration apparatus. At this point, the sample is allowed to stand quietly without manual agitation. The circulating pump, which has previously been adjusted to a rate of 1 liter per minute, is allowed to run continuously. The absorbance, as exhibited either on the spectrophotometer or the recorder, will increase and reach maximum within 30 seconds. As soon as the recorder pen levels off, approximately 1 minute, open the bypass valve and continue the aeration until the absorbance returns to its minimum value. Close the bypass valve, remove the fritted tubing from the BOD bottle and continue the aeration. Proceed with the standards and construct a standard curve by plotting peak height versus micrograms of mercury.

4.5 Analysis.

4.5.1 Weigh triplicate 0.2g ± 0.001 g portions of dry sample and place in bottom of a BOD bottle. Add 5 ml of distilled water and 5 ml of aqua regia. Heat 2 minutes in a water bath at 95°C. Cool and add 50 ml distilled water and 15 ml potassium permanganate solution to each sample bottle. Mix thoroughly and place in the water bath for 30 minutes at 95°C. Cool and add 6 ml of sodium chloride-hydroxylamine sulfate to reduce the excess permanganate. Add 55 ml of distilled water. Treating each bottle individually, add 5 ml of stannous sulfate and immediately attach the bottle to the aeration apparatus. With each sample, continue as described in paragraph 4.4.1 of this method.

4.5.2 An alternative digestion procedure using an autoclave may also be used. In this method 5 ml of concentrated H_2SO_4 and 2 ml of concentrated HNO_3 are added to the 0.2 grams of sample. 5 ml of saturated $KMnO_4$ solution are added and the bottle is covered with a piece of aluminum foil. The samples are autoclaved at 121°C and 2.1 kg/cm^2 (ca. 15 psig) for 15 minutes. Cool, make up to a volume of 100 ml with distilled water, and add 6 ml of sodium chloride-hydroxylamine sulfate solution to reduce the excess permanganate. Purge the dead air space and continue as described in paragraph 4.4.1 of this method.

5. *Calculation*. 5.1 Measure the peak height of the unknown from the chart and read the mercury value from the standard curve.

5.2 Calculate the mercury concentration in the sample by the formula:

$$\mu\text{g Hg/gm} = \frac{\mu\text{g Hg in the aliquot}}{\text{wt. of the aliquot in g}}$$

5.3 Report mercury concentrations as follows: Below 0.1 μg/g; between 0.1 and 1 μg/g, to the nearest 0.01 μg/g; between 1 and 10 μg/g, to nearest 0.1 μg; above 10 μg/g, to nearest μg.

6. *Precision and accuracy*. 6.1 According to the provisional method in reference number 5, the following standard deviations on replicate sediment samples have been re-

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[3] Mention of trade names or specific products does not constitute endorsement by the Environmental Protection Agency.

corded at the indicated levels: 0.29 μg/g ± 0.02 and 0.82 μg/g ± 0.03. Recovery of mercury at these levels, added as methyl mercuric chloride, was 97 and 94%, respectively.

7. *References.*

1. Bishop, J. N. "Mercury in Sediments," Ontario Water Resources Comm., Toronto, Ontario, Canada, 1971.

2. Salma, M. Private communication, EPA Cal/Nev Basin Office, Alameda, California.

3. Hatch, W. R., and Ott, W. L. "Determination of Sub-Microgram Quantities of Mercury by Atomic Absorption Spectrophotometry," Ana. Chem. *40*, 2085 (1968).

4. Bradenberger, H. and Bader, H. "The Determination of Nanogram Levels of Mercury in Solution by a Flameless Atomic Absorption Technique," Atomic Absorption Newsletter *6*, 101 (1967).

5. Analytical Quality Control Laboratory (AQCL), Environmental Protection Agency, Cincinnati, Ohio, "Mercury in Sediment (Cold Vapor Technique)," Provisional Method, April 1972.

6. Kopp, J. F., Longbottom, M. C. and Lobring, L. B. "Cold Vapor Method for Determining Mercury," Journal AWWA, 64, 1 (1972), pp. 20–25.

7. "Manual of Methods for Chemical Analysis of Water and Wastes," Environmental Protection Agency, EPA-625/2-74-003, pp. 118–138.

[38 FR 8826, Apr. 6, 1973, as amended at 40 FR 48310, Oct. 14, 1975]

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APPENDIX VI

SUBCHAPTER H - Ocean Dumping

40 CFR 220-229

(42 FR 2462-2490)

January 11, 1977

federal register

TUESDAY, JANUARY 11, 1977

PART VI

ENVIRONMENTAL PROTECTION AGENCY

■

OCEAN DUMPING

Final Revision of Regulations and Criteria

Title 40—Protection of Environment

(FRL 667-7)

CHAPTER I—ENVIRONMENTAL PROTECTION AGENCY

SUBCHAPTER H—OCEAN DUMPING

FINAL REVISION OF REGULATIONS AND CRITERIA

The Environmental Protection Agency today publishes final regulations and criteria with respect to the transportation of wastes for the purpose of ocean dumping. Under Title I of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, 33 U.S.C. 1401 et seq., (hereafter "the Act") the Agency on October 15, 1973, (38 FR 28610 et seq.) published regulations setting forth the procedures to be followed, and the criteria to be applied, in reviewing applications to dispose of materials in ocean waters. These rules now appear at 40 CFR Parts 220–227. In addition, the October 15 notice set forth substantive criteria to be applied in evaluating permits to discharge materials through ocean outfalls, pursuant to sections 402 and 403(c) of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1342, 1343. The regulations published today delete all reference to section 403(c) ocean outfall criteria and make Parts 220–227 (with the addition of Parts 228 and 229) solely addressed to ocean dumping and implementation of the Act. In the near future the Agency will propose significant revisions to the criteria for ocean outfalls.

The final regulations and criteria published today affect both the procedures to be followed in reviewing applications for ocean dumping and the substantive criteria to be applied in evaluating those applications.

The revisions announced today do not include changes to 40 CFR Parts 223 and 226. Significant changes will be made to those Parts in the near future. Parts 223 and 226 will be greatly expanded to present more detailed procedures for enforcement proceedings and for proceedings brought to revoke or suspend a permit pursuant to section 105(f), 33 U.S.C. 1415(f). However, these Parts as presently in force are reprinted here as they originally appeared to provide a complete set of the regulations presently in force.

The Agency believes that changes in the present regulations announced today are appropriate for several reasons:

Operating experience of EPA pointed to several ways in which the regulations required modification. There is a need to specify in more detail the considerations which go into a determination of whether a permit will be issued. The present regulations do not adequately address the regulation of ocean dumping sites. Also, some people consider the present regulations inadequate with respect to the disposal of dredged material.

A petition for additional rulemaking by the National Wildlife Federal was received in April of 1974 and pointed out several areas in which the present regulations require changes if they are to completely satisfy the Act, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (hereafter, "Convention") open for signiature December 29, 1972, at London, and the Amendments to the Act in light of the Convention which were brought about by Pub. L. 93–254 (March 22, 1974). The Convention became effective, according to Article XIX (1), on August 30, 1975, when the fifteenth party acceded to its terms. The first Consultative Meeting of the Contracting Parties was held in London in September, 1976, and these final regulations reflect agreements on procedures reached at that meeting.

In addition to the petition from the National Wildlife Federal, an individual has requested that the emergency permit provisions contained in the regulations be modified to require more adequate public notice and opportunity for hearing prior to the issuance of those permits. EPA has thoroughly revised and expanded the ocean dumping regulations and criteria to allow for greater public participation in the program.

The Agency has held several major hearings on applications to dispose of materials; the experiences of these hearings and the Regional Administrators' experiences in reviewing applications have prompted several suggestions as to ways in which the present regulations and criteria can be improved to more adequately address the implementation of the Act and Convention, and to address the problems encountered by the Regional Administrators.

The criteria have been modified to reflect recent advances in scientific knowledge, but there is no change in EPA's intent to eliminate ocean dumping of unacceptable materials as rapidly as possible.

It is not possible to note in this preamble all the places in the regulations in which changes have been made; many modifications are minor and will not affect the day-to-day operation of the program. However, the major substantive changes have been noted below. It must be emphasized that these final regulations will replace or amend seven existing Parts of Title 40 CFR, and will add Part 228. While the regulations appear to be long and complicated, the Agency has attempted to follow a logical pattern which will make their use more convenient than one might assume at first inspection. It also must be noted that these regulations will constitute the entire set of tools one needs to implement the Act and the Convention.

These regulations and criteria were published in proposed form in the FEDERAL REGISTER on June 28, 1976, (41 FR 26644 et seq.) and a Draft Environmental Impact Statement on the criteria (Parts 227–228) was issued on July 14, 1976. The public comment period closed September 24, 1976; 75 sets of comments were received comprising some 375 pages. Some substantive technical issues were raised, and EPA held a technical workshop on October 19–20, 1976, concerning the trace contaminant and dredged material criteria. The comments received, the EPA responses to the individual comments, and the report and transcript of the technical workshop are all included in the Final Environmental Impact Statement which is available from the address given at the end of this preamble.

SUMMARY OF CHANGES MADE AS A RESULT OF COMMENTS RECEIVED

PART 220

Section 220.1—Purpose and scope. One commenter suggested that Section 220.1 (a)(3)(ii) be changed to apply these regulations to a 200-mile contiguous zone. This is not possible since the Act limits jurisdiction over foreign flag vessels to the territorial sea and the 12-mile contiguous zone of the United States. See section 2(c) of the Act, as amended by Pub. L. 93-254 (33 U.S.C. 1401).

It has been suggested that Section 220.1(c)(4) be changed to refer to "human life at sea" rather than "life at sea." The language of this section follows that of the Act. It is implicit that this section refers to human life.

Section 220.2—Definitions. The definition of sewage treatment works in paragraph (b) has been amended to make it consistent with the definition found in the FWPCA.

Section 220.3—Categories of permits.

(c)—Emergency permits. Consultation procedures for emergency permits have been adopted by the Contracting Parties to the International Convention. The procedures in these regulations are consistent with those adopted on an international basis.

(d)—Interim permits. The Agency received a substantial number of comments with respect to the interim permit provisions.

Section 220.3(d) in its revised form provides that interim permits will be issued after April 23, 1978, only to interim permit holders who have exercised best efforts to meet the requirements of a Special permit by that date and have implementation schedules adequate to allow phasing out of ocean dumping or compliance with the requirements of a special permit, by December 31, 1981.

Commenters have questioned the legality of interim permits under the Act, and have further questioned the issuance of interim permits after the 1978 deadline. Others have argued that the 1978 cutoff date is too strict. Some have suggested that this deadline be deleted altogether, with applications for interim permits to be considered on a case-by-case basis.

Interim permits are not illegal under the Act, since they do not authorize dumping which would "unreasonably" degrade or endanger the marine environment. The Act lists need for ocean dumping as one factor to be considered in issuing permits. The "need factor" has outweighed other considerations due to the lack of alternative methods of disposal and technology necessary to meet environmental criteria. The need factor is largely a matter of time, and interim permits have been issued in order to give existing dumpers sufficient time to develop alternatives or to comply with environmental criteria. It should be noted that in no event does this section authorize dumping of materials that are absolutely barred by the Act or the Convention, or authorize dumping above trace contaminant levels of materials proscribed above trace contaminant levels.

The April 23, 1978, deadline corresponds to the fifth anniversary of the effective date of the Act. This date is significant in that Title II of the Act provides for a research program aimed at "minimizing or ending all dumping of materials within five years of the effective date of this Act." Congress has expressed impatience with the continued issuance of interim permits (see H.R. Rep. No. 94–1047, 94th Cong., 2d Sess. (1976)), and the EPA agrees that five years is sufficient time for dumpers to develop technology to end reliance on ocean dumping which violates environmental criteria.

Existing dumpers who are unable to meet the 1978 deadline may receive interim permits after that date if they have implementation schedules adequate to allow phasing out of ocean dumping or compliance with all requirements of a special permit by December 31, 1981. Experience to date has shown that, while five years is sufficient time to develop alternatives and technology, three more years are needed to implement them. The 1981 deadline is based on the implementation schedules contained in current interim permits, all of which provide for compliance or phasing out by the end of 1981. The proposed regulations required implementation schedules for industrial dumpers to provide for compliance or phasing out by April 23, 1981. Revised § 220.3(d) changes this date to December 31, 1981, since it now applies also to municipal dumpers, who are unable to meet the April 23 date.

It has been suggested that the 1981 compliance date be changed to 1979 for industrial dumpers. This change has not been made since some industrial dumpers are expected to meet the 1981 deadline but would not be able to meet a 1979 deadline. It should be stressed that § 220.3(d) requires implementation plans to provide for phasing out or compliance by December 31, 1981, at the latest. Interim permit holders who are able to meet earlier deadlines will be required to do so. Interim permits with earlier deadline dates are not to be deemed to be affected by the regulations promulgated today.

The deadlines contained in this section are based on current projections of technological feasibility, and it is reasonable to expect dumpers to meet them. The primary purpose of the Act is to protect the marine environment, and dumping in violation of environmental criteria cannot be allowed to continue indefinitely. The EPA therefore will not retain discretion to issue interim permits to applicants who do not meet the requirements of this section.

The proposed regulations authorized issuance of interim permits for sewage treatment works on a showing that the dumper had exercised best efforts to comply with the requirements of a special permit. They did not require the dumper to have an implementation schedule adequate to permit compliance or phasing out by a specific date. No deadline was imposed on municipal dumpers because of their often complicated dependence on public agency funding sources. In response to several objections, the distinction between municipal and industrial dumpers has been removed, and all holders of interim permits will now be required to meet a deadline of no later than 1981. Technology exists to permit municipalities to meet this deadline; and all interim permits currently held by municipalities provide for compliance or phasing out by the end of 1981.

Thus, the regulations promulgated today do not substantially affect the planning which must be conducted by municipalities in light of the terms of existing interim permits held by those communities. It is noted that in a letter to the Administrator dated October 26, 1976, from Congressmen Robert L. Leggett, John B. Breaux, Edwin B. Forsythe and Charles A. Mosher, all of the Subcommittee on Fisheries and Wildlife Conservation and the Environment of the Committee on Merchant Marine and Fisheries, it was strongly recommended that municipalities and industries be treated the same, with respect to interim permits. The Agency has changed the final regulations consistent with this recommendation.

New interim permits may be issued after 1978 to existing dumpers who exercise best efforts to comply with the requirements of past permits. As an example, municipal dumpers will not be denied new permits for inability, despite best efforts, to raise necessary revenues to comply with implementation schedules. While the precarious financial position of some municipalities may justify noncompliance with implementation schedules, it is expected that few, if any, exceptions will be granted by the Agency. The showing which must be made is significant, such as demonstrating that an outside construction or waste disposal firm with which the municipality has entered into contracts has become insolvent. In the past the communities employing ocean dumping as the means to dispose of sludge have on occasion submitted bare conclusions that no other alternatives are available. Not only will half-hearted attempts at compliance with the regulations and weak efforts to find alternatives not be considered to be good faith efforts under the revised criteria, but the Agency will undertake independent enforcement actions to stop such practices. It is not expected that financial reasons will be sufficient justification for noncompliance by industrial dumpers.

Section 220.3(d) authorizes issuance of interim permits after 1978 to dumpers who have implementation schedules adequate to allow phasing out of ocean dumping or compliance with the requirements of a special permit by 1981. Congressmen Leggett, Breaux, Forsythe and Mosher, in their letter of October 26, 1976, to the Administrator, have recommended that EPA make it explicit "that the choice between phasing out and complying with the criteria for a special permit is to be made by EPA—not by the applicant." Section 227.23 does make clear that this choice is up to the Regional Administrator.

Other commenters have challenged the authority of EPA to require phasing out of ocean dumping, maintaining that special permits must be issued to all applicants who meet the requirements therefor.

Subpart C of Part 227 provides that special permits may be denied to applicants who have no need to ocean dump, a factor which the Act directs the EPA to consider in issuing permits. The environmental criteria of Part 227 indicate only that the materials to be dumped by a particular dumper are not environmentally unacceptable. Since the cumulative effects of many dumpers may be environmentally unacceptable, the EPA must limit the total amount of ocean dumping and will therefore grant permits only to applicants who demonstrate lack of acceptable alternatives to ocean dumping. The purpose of implementation plans is to assure that dumping in violation of the requirements of Part 227 does not continue indefinitely. The Regional Administrators must have discretion to determine whether this purpose will be achieved by compliance with special permit requirements or by obviating the need for dumping.

Section 220.3(d) also provides that new interim permits will be issued only to applicants who demonstrate that they have exercised best efforts to comply with all requirements of previous permits.

One commenter has objected to this provision as requiring denial of permit applications for minor violations of previous permits. The same commenter has suggested that permit violations be dealt with according to the terms of the permit, rather than by denying future permits. There is no reason not to require permit holders to follow all terms of their permits in good faith, and it will be within the discretion of the Regional Administrator to determine whether best efforts have been exercised.

The primary purpose of this provision is to ensure compliance with implementation schedules. Most interim permits provide for compliance with schedules to be determined as of the expiration date of the permit. If there are no penalties for noncompliance during the term of a permit, the only way to enforce compliance is to deny subsequent permits.

There is no reason to give interim permits to dumpers who have demonstrated an unwillingness to exercise best efforts to comply with the terms of a permit.

Several minor changes have been made in § 220.3(d) in response to comments.

The proposed regulations provided for the issuance of interim permits "under certain conditions in accordance with Subpart A of Part 227". One commenter requested examples of the "certain conditions" under which interim permits would issue. Since the phrase "certain conditions" referred only to the conditions specified in Subpart A and was therefore redundant, it has been deleted.

The phrase "has a treatment facility under construction" has been changed to "has an implementation schedule" since there are methods to phase out dumping or comply with environmental criteria which do not require construction of treatment facilities.

Proposed § 220.3(d) would deny interim permits to the "expansion or modification of an existing facility". Since it has been pointed out that many implementation plans require modification or expansion, this provision has been changed to deny interim permits "for the dumping of an increased amount of waste from an existing facility".

The criticism of EPA's repeated use of interim permits has come from many informed persons, and the objections have been given careful consideration. As expressed by Congressmen Leggett, Breaux, Forsythe and Mosher in the letter of October 26, 1976, to the Administrator, "EPA continues to allow a substantial volume of dangerous, toxic materials to be dumped under 'interim permit' arrangements. * * * We feel that such 'interim permits' should be summarily phased out without continued exceptions. The revised regulations * * * do not effect the intent of Congress as expressed in the Marine Protection, Research, and Sanctuaries Act of 1972."

The answer to the question of repeated use of interim permits is founded on the lack of firm scientific conclusions with respect to individual and combined dumping of wastes in the oceans. The answer to this question is inextricably linked to the issues of defining trace contaminants and to the setting of special permit conditions. If materials are in trace quantities or less, or if they comply with special permit conditions, then one need not rely on interim permits for continued dumping. Thus, by lenient definitions of trace contaminants or special permit criteria, the Agency could avoid the interim permit dilemma. Obviously, the Agency will not arbitrarily define trace contaminants or special permits to so avoid the issues.

What the Agency has attempted to do is to estimate as best it can those levels of pollutants which may be expected to cause environmental harm, to apply a safety factor, and to refuse to sanction dumping of wastes containing pollutants in these amounts unless there is no other environmentally acceptable alternative. EPA has also tried to prepare its regulations in view of criteria established under the Federal Water Pollution Control Act, State laws, and other Federal pollution control laws. Obviously it makes little sense to allow discharges of mercury through a pipe into Chesapeake Bay at levels higher than discharges from a barge into the deep ocean waters, for example. The Agency also must consider its credibility as the regulating agency. If it demands that a small community or an industry cease dumping within a period of time, it should be confident that there are feasible alternatives which may be implemented within that time period. Increasingly, this is true; and this is the reason all interim permit holders have been given firm phase-out dates. It would be improper to adopt a cessation date which has little factual foundation. Increasingly, EPA has become aware that the alternatives to ocean dumping require careful evaluation; they may not always be better.

The interim permit remains EPA's most effective tool because it requires the permittee to periodically report to EPA as to the steps being taken to cease dumping or bring the dumping within the special permit limits, allows EPA to retain conservative limits on special permits, and gives EPA the flexibility to refuse reissuance when the Agency concludes that good faith efforts to find alternatives are not being made. EPA refused to reissue an interim permit to the City of Camden.

Conceivably, EPA could abolish the category of interim permits or make interim permits of a five-year duration. This would avoid some of the stigma attached to the Agency's repeated issuance to the same applicant of interim permits. As with an artificial modification of the special permit criteria, these options are unacceptable to EPA.

It must be emphasized that the numerical limits on special permits (which define when interim permits only can be obtained) are not founded on the most precise analytical process. They may be within orders of magnitude of a "correct" limit, but there is no confident means to determine this. EPA has over the past four years conducted several open workshops with respect to the "safe" or "unacceptable" levels of pollutants which may be dumped into the oceans. The latest was in October of this year. The only agreement reached at those sessions is that responsible scientists are not confident as to a "safe" number and that measuring environmental effects in the ocean is most difficult. With respect to any suggested alternative permit criteria, significant objections can be raised. In the discussion of § 227.6 below, more details are presented with respect to this problem.

The question, then, is not whether EPA has established environmentally unacceptable levels and continues to issue permits which violate those levels, but is whether EPA (1) has established levels which responsibly estimate concentrations of wastes not acutely toxic or otherwise clearly harmful; (2) has created a permit system which forces dumpers to find satisfactory alternatives as soon as possible; and (3) has established environmental criteria which are not inconsistent with criteria established under other laws with respect to discharges into inland waters. EPA believes it has adequately met these regulatory challenges.

(f) Permits for incineration at sea. One commenter has suggested that § 220.3(f) be revised to allow only research or interim permits to be issued for incineration at sea until criteria on this type of disposal are promulgated. This change has not been made. While there is currently insufficient information on which to base general criteria for ocean incineration, it is possible to conduct sufficient research on specific incineration projects to satisfy EPA that special permits should be issued in specific instances.

PART 221

Section 221.1—Applications for permits. This section has been revised slightly to require that applications must be in writing, but not necessarily by letter; that a full evaluation of all alternatives is not necessary; and that the environmental impact of alternatives must be considered.

Section 221.4—Adequacy of information in application. This section has been revised to allow an "adequate" description of the material to be dumped, rather than requiring a "full" description. It was pointed out that, in a practical sense, it would be impossible to ever achieve a "full" description of any material.

PART 222

In response to public comments, the Agency has made several changes in the regulations which govern procedures to be followed in reviewing applications for ocean dumping permits.

Section 222.3—Notice of applications. The Coastal Zone Management Program of the Commonwealth of Massachusetts recommended that the notice requirements of § 222.3(b) be modified to provide that the State agencies with responsibility to implement the Coastal Zone Management Act also receive notice of applications for ocean dumping permits. The requested modification has been made. Also, in paragraph (g) of that section, a sentence has been added to clarify that copies of these notices will also be sent to officials of the Departments of Commerce and Interior who are responsible for programs which may be affected by ocean dumping.

The notice provisions of § 222.3 prompted several requests for major expansion of the procedures to be followed in providing notices to the public of ocean dumping applications. Some commenters suggested that notices be placed in several newspapers in the area from which the transportation for the purpose of dumping is to commence; other commenters asked that specific provisions be included in the FEDERAL REGISTER for service of notices on particular states and private parties. Some parties stated that the notice provision does not provide adequate time to comment on the application. Other parties are protesting that the notice provision allowed for unnecessary delay in the processing of applications.

The Agency believes that adequate notice is provided to the public by regulations promulgated today. In practice, the Regional Administrators provide substantially more notice to parties known to be interested in ocean dumping matters and to Federal and State authorities within those Regions than is provided in these regulations. The intent of the regulations promulgated today is not to dictate the procedure which may be followed in each instance but rather to state the minimum procedures which must be followed. Several of the commenters who wish to be provided with more elaborate notice of proposed applications may receive substantially more details on proposed dumping than is provided for in this Part by simply requesting the Regional Administrator for the Region in which they are located to so provide with respect to each ocean dumping application. Likewise, parties who believe that they will continue to have an interest in ocean dumping matters may resuest that they be sent detailed information on each application. With respect to the request that the notice provisions allow for more or less time, the Agency believes that the present regulations provide an adequate compromise between the need to allow parties to prepare adequately for presentations at the public hearings and for the need to promptly process ocean dumping applications. The Agency is concerned that the entire permit review process may take an unreasonable period of time if lengthy periods are allowed at the various stages to provide opportunity for parties to prepare new objections or recommendations to the proposed Agency action. The present regulations attempt to allow time for responsible participation in the permit review process while at the same time expediting that process.

Section 222.4—Initiation of hearings. A change has been made to the proposed § 222.4(b). In accordance with the decision of Judge Gerhard A. Gesell in the case of "State of Maryland et al. v. Train et al." (D.Md. Civil Action No. 5-1731) May 10, 1976, 8 ERC 2050, 2054, the Agency discretion with respect to the convening of the initial public hearing is narrowly circumscribed. Therefore, the final regulations state that the initial hearing may be called whenever a person properly requests such a hearing or whenever the Administrator or Regional Administrator, as the case may be, determines that such request presents genuine issues. The prior language required that the request present "substantial issues of public interest". It is intended that the Administrator or Regional Administrator deny the request for a hearing only when it is clear that the request is not in good faith or raises issues which have been clearly addressed in prior hearings when there is no new evidence. Denials of hearing requests will be rare.

Section 222.8—Recommendations of Presiding Officer. This section has been amended to provide that the recommendations of the Presiding Officer shall include a description of evidence relied upon. Most recommended decisions have already included such a description of evidence, but this amendment clarifies the requirement. It is not intended that this regulation will require that the presiding officers cite to a transcript or exhibit for every fact for which they rely upon; rather, it is merely intended to ensure that there is a clear explication of the factual bases for the recommended decision.

Section 222.9—Issuance of permits. In § 222.9(b)(1) the last phrase has been deleted because a change has been made to § 222.10(b) to the effect that the Administrator or Regional Administrator may not on their own discretion convene an adjudicatory hearing. A new paragraph (c) has been added to this section to make clear that the term of a presently valid permit may be extended pending the conclusion of the proceedings held pursuant to §§ 222.7–222.9, at the discretion of the Administrator or Regional Administrator.

Section 222.10—Appeal to adjudicatory hearing. Paragraph (a) of this section has been amended to provide that the request for an adjudicatory hearing must be sent within 10 days following the receipt of the notice of issuance or the denial of a permit. The previous language required computation of the 10 days following the dispatch of the notice. In all time requirements under the Part 222 rules, if a document is sent by the required date, it is considered timely even if it is received after the time constraint. As noted above, paragraph (b) has been changed to delete the reference to the Administrator or Regional Administrator convening a public hearing sua sponte. The original assumption was that there may be rare circumstances in which it may be appropriate for the Agency to convene an adjudicatory hearing to resolve difficult factual issues; it was pointed out by many commenters if there are significant factual issues involved there no doubt will be a request for such a hearing. Paragraph (b) has also been amended to provide that the Administrator or Regional Administrator, as the case may be, may call an adjudicatory hearing when a proper request has been made and when he determines that such a hearing is warranted. The change deletes the language requiring that such a request present substantial issues of public interest. This modification makes clear that discretion is allowed the Administrator or the Regional Administrator to determine the appropriateness of the convening of an adjudicatory hearing. It is anticipated that requests for adjudicatory hearings which raise genuine issues and which are brought in good faith, not in an attempt to delay, will be acted upon favorably by the Regional Administrator or Administrator. Adjudicatory hearings should be commenced as soon as possible following granting of the request. The provision in these regulations for the convening of an adjudicatory hearing is an effort by EPA to provide a forum for resolution of major factual issues which may be involved in the more significant permit proceedings.

In paragraph (c) modification has been made to allow the Administrator or Regional Administrator, prior to the conclusion of the adjudicatory hearing and appeal process, to extend the duration of the previously issued permit until a final determination has been made. This change follows substantially the recommendation made by the City of Philadelphia.

Section 222.11—Conduct of adjudicatory hearings. The first sentence of this section has been modified to delete the word "any" and insert the words "a reasonable" to modify the time in which someone must request to be admitted as a party to an adjudicatory hearing. The reason for the change is that persons should not be allowed to wait until the last minute to enter an adjudicatory hearing and thus to possibly alter the issues which have been narrowed for consideration at that hearing. The last sentence of paragraph (a) is new. It clarifies that the EPA staff will automatically be considered a party to the adjudicatory hearing.

In paragraph (d), subparagraph (6) has been deleted. This had provided that the prehearing conference could include discussion of prehearing discovery. It was concluded that prehearing discovery in most instances would be inappropriate and would lengthen the hearing to be conducted pursuant to this section beyond the time contemplated when this section was originally drafted. Of course, the Presiding Officer may request that the parties undertake informal discovery to assist in the expedition of the actual hearing, but this discovery should not be overly formal or time-consuming.

There was a great deal of comment with respect to paragraph (e), setting forth the adjudicatory hearing procedures. Much of the comment went to the statement that the burden of proof shall be on the applicant in the case of adjudicatory hearings held pursuant to § 222.10. This subsection has been changed. It now provides that, in the case of adjudicatory hearings held pursuant to § 222.10(b)(1), the person filing the request under § 222.10(a) has the burden of going forward as to each issue raised by that request. This suggestion substantially follows the recommendation made by the City of Philadelphia. Furthermore, references to the burden of proof have been deleted since it was deemed inappropriate to attempt to allot the burden of proof in procedural regulations. The Legislative History of the Marine Protection, Research, and Sanctuaries Act of 1972, as amended, is clear that the overall burden of persuasion rests with the applicant for permit with respect to basic issues which must be satisfied for a permit to be issued.

Paragraph (e)(5) has been changed to provide that rulings of the Presiding Officer on the admissibility of evidence, the propriety of cross-examination, and other procedural matters merely shall appear in the record. The prior statement that these rulings shall be final has been deleted since these issues can be clearly raised on appeal. And since interlocutory appeals are disallowed, there is no necessity for such a phrase.

In paragraph (f), which addresses the procedures to be followed after the close of the adjudicatory hearing, the page limitations on briefs and other documents have been revised to allow the filing of lengthier documents.

Section 222.12—Appeal to Administrator. Consistent with changes made to other sections of Part 222, in paragraph (a) the ten-day limitation begins to run after receipt of the determination of the Regional Administrator rather than after the determination itself. Also, in later subsections of this section, the page limitations have been expanded slightly to allow more opportunity to summarize and comment on the findings and conclusions of law.

Section 222.13—Computation of time. This section is new. It has been added to clarify the means by which calculation of time should be accomplished. The section is identical to 40 CFR § 125.44, which applies to National Pollutant Discharge Elimination System Permit proceedings.

PART 223

Revisions to this Part will be promulgated in the near future.

PART 224

Section 224.2—Reports. Specific language has been added to state the type of information that must be reported when an emergency dump at sea is made.

PART 225

Section 225.2—Review of Dredge Material Permits. The requirement that EPA respond to Corps of Engineers permit actions only after a notice of intent is received has been deleted, since a permit action may be terminated prior to that point in some cases, and EPA review would normally begin prior to issuance of a notice of intent.

PART 226

Revisions to this Part will be promulgated in the near future.

PART 227

Many of the comments severely criticized the lack of a definition for "trace contaminants", the basis upon which the trace contaminant levels were set, and the differences between the dredged material criteria and the criteria for other materials. A technical workshop was convened by EPA to discuss these issues. There was general agreement among the participants that the criteria should be based, wherever possible, on impacts of dumped materials on marine ecosystems, and that these impacts could be measured best by bioassays rather than by relying on determination of total amounts of specific constituents present in a waste. The full transcript of that workshop is included in the Final EIS.

It was recognized that dredged material is merely a special case of a material containing liquid, suspended particulate, and solid phases, and that, while bioassay techniques on liquid materials have been developed to the point where they can be applied on a routine basis, bioassay techniques for the suspended particulate and solid phases of materials are still in an advanced stage of research and are not yet available for routine use. Nevertheless, the participants agreed that the criteria should be based on solid phase bioassays, recognizing that there will be an interim period during which the procedures will have to be specified on a case-by-case basis, and that such interim procedures may be less reliable and more difficult to perform than procedures which will be developed in the future.

Sections of Part 227 have been revised to reflect the recommendations of the workshop; thus, all criteria are based on ecosystem impact rather than on assumptions regarding allowable deviations from normal ambient values. These revisions are consistent with the concept of "unreasonable degradation" in these regulations and are directed toward achieving the goal of preventing significant impact on the biota. The use of bioassay results for regulatory purposes will provide EPA with direct measurements of the impact of dumping materials, so that it will no longer be necessary to infer damage indirectly through measurements related to normal ambient values.

Substantial revisions have been made in §§ 227.6, 227.13, and Subpart G. Details of the specific changes are presented below in the discussion of those sections. In general, § 227.6 has been revised to use liquid, suspended particulate, and solid phase bioassays as the basis for determining trace contaminants; § 227.13 has been changed to require bioassay results to be used in determining whether or not dredged material is environmentally acceptable for ocean dumping; and Subpart G has been revised to include definitions of liquid, suspended particulate, and solid phases, and of initial mixing allowances and limiting permissible concentrations for both liquid and solid phases.

Section 227.1—Applicability. Paragraph (b) of this section has been changed to make all of § 227.6 as well as §§ 227.9 and 227.10 applicable to dredged material, in addition to the other sections already made applicable. This is consistent with changes made in §§ 227.6, 227.13, and Subpart G.

Section 227.6—Trace contaminants. This section has been completely redrafted in response to the many comments received and to reflect the agreements reached at the technical workshop called by EPA to discuss those comments received during the public comment period. The redrafted section differs from that in the proposed regulations published on June 28, 1976:

1. The Agency is providing a broad narrative interpretation of the term "trace contaminants." The term "trace contaminants" is used in the Convention only, not in the Act. When the contracting parties to the Convention define this term, the United States will be bound by that definition. Should the Convention adopt a definition requiring more stringent operational levels than the United States is using, these levels will have to be changed accordingly. In the meantime, the Act and the Convention can be enforced effectively by stating the basis for regulation of these constituents.

Section 227.6(b) provides in general terms that these constituents will be considered as trace contaminants only when they are present in such amounts and forms that they will cause no significant undesirable effects through either toxicity or bioaccumulation.

2. Section 227.6(c) states the criteria for special permits and for wastes which otherwise can be deemed environmentally acceptable under Subpart B. Paragraph (c) of § 227.6 does not define trace contaminants; it merely states what is acceptable for ocean dumping under the environmental criteria of Subpart B. The test to be applied on all wastes is the direct determination of the impact of these constituents present in a waste on the marine ecosystem, as measured by bioassay techniques.

For liquid wastes and the liquid phases of mixed wastes, it is assumed that all of these constituents present are in forms available to the biota. Section 227.6(c)(1) provides that constituents in the liquid phase will be considered environmentally acceptable (i.e., they qualify for special permits) if they conform to the EPA marine water quality criteria. These criteria are based on the most recent and comprehensive compilation of bioassay data presently available, and recommend permissible ambient levels to avoid either chronic toxicity or potential for bioaccumulation of toxic materials, whichever factor is more restrictive. Thus, by applying the marine water quality criteria to the liquid phase, it is practical to determine environmental impact through chemical analysis.

For mercury, however, the marine water quality criteria are set near the lowest ambient levels observed in ocean waters; ambient levels in many parts of the ocean deviate from this level significantly. Therefore, an allowance for an increase in mercury of 50 percent over the local ambient level after initial mixing is allowed. This is consistent with the existing criteria for both liquid and solid phases, which are based on the range and variation of historically observed values for mercury in ocean waters and sediments. It should be noted that "normal ambient concentrations" refers to concentrations that would be present were there no dumping in the area. It should also be noted that, within areas for which a natural ambient concentration has been identified, deviations in mercury concentration up to 100 percent are not uncommon; allowing for a change of 50 percent of the average ambient levels therefore falls within the range of deviation which occurs naturally in ocean waters.

There are some organohalogens for which marine water quality criteria have not been set at this time. When such compounds are present in the liquid phase of a waste, bioassay data on those specific compounds must be presented by the applicant, either through his own efforts or from a search of the scientific literature. Alternatively, a bioassay may be performed on the waste itself rather than on these specific constituents, but such bioassays must be of such a nature as to provide data on chronic toxicity and bioaccumulation potential.

For suspended particulate and solid phases, however, the state-of-the-art has not yet advanced to the point where sediment quality criteria can be set. In fact, research on benthic bioassays is only now at the stage where interim procedures can be developed and used. Nevertheless, there was general agreement among the participants at the technical workshop that even the interim procedures now available provide much better information on the impact of solid phases of waste materials on the marine ecosystem than does any form of bulk analysis. Therefore, bioassays on the solid phase are called for in the criteria, recognizing that interim procedures must be used for a period of several months until standard procedures are developed by EPA and Corps of Engineers research activities. EPA and the Corps of Engineers will publish jointly, in the very near future, standard benthic bioassay procedures. Until that time, guidance on interim procedures will be supplied by the Regional Administrator or the District Engineer. Interim and final benthic bioassay procedures acceptable for implementation of this section will deal with the chronic toxic effects or the bioaccumulation of mercury, cadmium, organohalogens, oils and greases.

The criterion for acceptability of a waste based on the solid phase bioassay is absence of significant difference between the control bioassay and the test bioassay due to the presence of any of the constituents listed in this section.

This section also recognizes that there may be carcinogens, mutagens, and teratogens, for which water quality criteria do not presently exist. In such cases, special studies may be required to establish appropriate limits. It is the intent of this section that such studies will be required, unless there is sufficient information in the scientific literature for the Regional Administrator to determine acceptable levels of these constituents for ocean dumping. If there is insufficient information in the scientific literature and the applicant is unwilling to conduct special studies, a special permit will be denied under § 227.5(c), which prohibits the dumping of materials whose properties are insufficiently described to permit application of the Criteria.

3. Provision is made for the continuing use of the existing numerical levels for solid phases as an interim measure for those cases in which satisfactory interim bioassay procedures are not available.

The present levels allow about a 50 percent deviation from normal ambient values. This is a very stringent requirement and it should be retained as a basic requirement for use when further information is not available. The language has, however, been changed to allow the application, in the case of solid materials, of a limit not more than 50 percent greater than the normal ambient value in the vicinity of the proposed dump site. This is in response to comments pointing out that the data base on which these criteria were set is quite small and may not be representative of actual oceanic sediments which may contain significantly lower concentrations of these materials than is reflected in the numerical criteria.

This section, as redrafted, applies to all materials to be dumped, including dredged materials. The terms "liquid phase", "suspended particulate", and "solid phase" are defined in § 227.32, and apply to all materials containing soluble and insoluble materials.

Section 227.7—Limits established for specific wastes or waste constituents.

Paragraph (a) has been modified to clarify its application only to liquid materials immiscible with sea-water, not those which may interact with seawater. Paragraph (c) has been changed to clarify that the intent of the paragraph is to protect human health and that of the marine ecosystem. Paragraph (d) has been changed to include a requirement for no more than 10 percent change in acidity or alkalinity for neutralization of wastes.

Section 227.10—Hazards to fishing, navigation, shorelines, and beaches. This section has been changed to include the term "unacceptable" interference or damage rather than "no" interference or damage. This change was made in response to comments which pointed out the impossibility of proving that there is no possibility of interference or damage. Applicants will be required to present reasonable evidence that interference or damage will be avoided, and the Regional Administrator will have discretion to determine what is "unacceptable".

Section 227.13—Dredged materials. This section has been completely redrafted in response to comments pointing out that the dredged material criteria were not comparable to those for other materials. As redrafted, dredged material, as well as all other wastes containing liquid, suspended particulate and solid phases, must meet the requirements of §§ 227.5, 227.6, 227.9, 227.10, 227.13, and Subpart G, in order to be environmentally acceptable for ocean disposal.

An initial screening procedure is incorporated which is similar to the requirement of § 227.12 for inert natural wastes, except that the exclusions in § 227.13 are more specific than those in § 227.12. The rationale for these exclusions is presented in the final EIS. Dredged materials which cannot meet these requirements are subject to further testing of both the liquid and solid phases. To be environmentally acceptable for ocean dumping, the liquid phase, suspended particulate phase, and solid phase must meet both the trace contaminant requirements of § 227.6 and the Limiting Permissible Concentration requirements of § 227.27.

Since the concepts of liquid phase, suspended particulate phase, and solid phase apply to all multiphase materials, the definition of the liquid phase for dredged material (i.e., the elutriate) has been removed from § 227.13 and incorporated in the definitions of Subpart G as part of § 227.32.

Section 227.15—Factors considered in determining the need for ocean dumping. Paragraph (a) has been changed to require that treatment be useful as well as feasible. Paragraph (c) has been changed to include a provision for evaluating risks to the environment for the use of alternatives. This change is also reflected in § 227.16.

Section 227.18—Factors considered. A requirement for considering impact on potential recreational and commercial use is included.

Section 227.19—Assessment of impact. A requirement for assessing the impact of alternatives is included.

Section 227.27—Limiting Permissible Concentration (LPC). This section has been redrafted to define LPC for the liquid, suspended particulate, and solid phases. The liquid phase LPC has been associated, wherever possible, with the applicable marine water quality criteria, and the suspended particulate and solid phases have been based on the avoidance of overall chronic toxicity after allowance for initial dispersion. Procedures for conducting the appropriate bioassays will be published in the near future by EPA and the Corps of Engineers. Until such procedures are published, interim guidance can be obtained from the Regional Administrator or the District Engineer.

Some commenters pointed out that the proposed regulations do not explicitly require analysis of wastes for those constituents listed in Annex II of the Convention. EPA has not specifically enumerated these constituents since it is not necessary to do so in order to determine whether or not a waste is environmentally acceptable for dumping. Section 227.27(a)(1) requires compliance with all applicable marine water quality criteria; there are criteria for all materials listed in Annex II, except fluorides. Section 227.27(a)(2) requires a bioassay to be conducted on the waste, which will reveal toxic levels of any fluorides present, as well as of other chemical constituents which, though not listed in the Convention, may be toxic. The purpose of the Act and the Convention is to prevent unacceptable or unreasonable degradation of the marine environment. The combination of bioassay procedures specified in the criteria provide information on adverse impact directly for the entire waste. Thus, the presence or absence of any specific constituent, other than those listed in Section 227.6, is not a significant factor as long as the overall impact of the waste is known.

A provision has been added in this section to allow for changes in the application factor used to determine the LPC if there is reasonable scientific evidence on a specific waste to support such a claim. When such evidence is presented, on this or other scientific aspects of the criteria, EPA may convene an appropriate scientific review panel to examine the reasonableness of the evidence prior to taking action.

Section 227.29—Initial mixing. Initial mixing for the solid phase is included. Field data and mathematical models for predicting dispersion may be used where available; when they are not available, solid phases are assumed to be evenly distributed over the ocean bottom in an area equivalent to that of the release zone. This is an assumption, but it is a conservative one which would err on the side of environmental protection. Provision is also made in this section for using different approaches to initial mixing based on reasonable scientific evidence in specific cases.

Section 227.30—High-level radioactive wastes. It is noted that this definition, which is given in the Act, is more restrictive than that provisionally recommended by the International Atomic Energy Agency, which is the minimum standard binding on Contracting Parties to the Convention.

Section 227.31—Applicable marine water quality criteria. This is a new section added to define the applicable marine water quality criteria as being the criteria presented for marine waters in the EPA publication "Quality Criteria for Water" as amended by subsequent publications.

Section 227.32—Liquid, suspended particulate, and solid phases of materials. This is a new section added to define, for the purpose of these regulations, how liquid, suspended particulate, and solid phases are determined for different types of materials. Because some materials may interact with seawater, a general provision is included to give the Regional Administrator direction to require the use of elutriation with seawater when he has reason to believe that the elutriation procedure may reveal toxic effects which might otherwise remain hidden. These definitions apply to any multi-phase material regardless of origin; i.e., sewage sludge as well as dredged material.

The definition of the liquid phase of dredged material is the same as the definition of the elutriate in § 227.13(c) of the regulations proposed on June 28, 1976. For other materials containing both soluble and insoluble matter, the relative proportions of waste material and seawater are to be determined by EPA on a case-by-case basis. This gives EPA discretion to select the best proportions for measuring the maximum effect a material might have when dumped in seawater.

PART 228

Section 228.2—Definitions. The first sentence in this section has been changed to make that sentence consistent with other statements in Part 228. The term "disposal site" means an interim or final approved site, since the conditions of Part 228 clearly apply to those interim sites for which final Environmental Impact Statements have not yet been conducted and for which final designations, therefore, have yet to be made.

Section 228.4—Procedures for designation of sites. Paragraph (e) of this section has been revised in response to criticisms concerning the proposed procedures for designation of dredged material disposal sites. This section now explicitly states that EPA will designate dredged material disposal sites and describes the procedures that will be used.

These procedures are the same that are to be used in the designation of disposal sites for the dumping of materials under special and interim permits. The Act allows the Corps of Engineers to use other sites than those recommended by EPA when the use of EPA-designated sites is not feasible. This section requires that the same criteria be used by the Corps of Engineers in site designation as are used by EPA.

Section 228.12—Delegation of management authority for interim ocean dumping sites. The Coast Guard has withdrawn its request to have disposal sites reoriented to use LORAN-C time delay coordinates, and this section has been changed accordingly. The dredged material sites designated in § 228.4 have been added to the list of sites in the table following § 228.12.

ENVIRONMENTAL AND INFLATIONARY IMPACT STATEMENTS

Although the Agency is not required by law to prepare an Environmental Impact Statement in connection with revision of the regulations and criteria pertaining to ocean disposal, it has chosen to prepare such a statement with respect to the proposed revision to Part 227. See 39 FR 37419 (October 21, 1974). A final Environmental Impact Statement has been prepared and is available for inspection in the office noted in the last paragraph of this preamble. In addition, there are a limited number of the statements available to persons who have an interest in reviewing that document. Requests for copies should be sent to the address noted below.

Executive Order 11821 (November 27, 1974) requires that major proposals for legislation and promulgation of regulations and rules by agencies of the Executive Branch be accompanied by a statement certifying that the inflationary impact of the proposal has been evaluated; OMB Circular A-107 (January 28, 1975) prescribes guidelines for the identification and evaluation of major proposals requiring preparation of inflationary impact certifications. The Administrator has directed that EPA regulatory actions will require certification when they are likely to result in: (1) annualized costs exceeding $100,000,000; (2) total additional costs of production of any major project exceeding 5 percent of selling price; or (3) increase in net national energy consumption by the equivalent of 25,000 barrels of oil per day. None of these limiting criteria is exceeded by the proposed revisions announced today and, therefore, an inflationary impact statement has not been prepared.

These regulations and criteria will become effective February 10, 1977, and all ocean dumping permits issued after that date must be in compliance with these regulations and criteria.

The Agency will consider all written comments on these final regulations and criteria in making any future revisions. Comments should be provided in triplicate and addressed to Chief, Marine Protection Branch (WH-548), Oil and Special Materials Control Division, Environmental Protection Agency, 401 M Street SW, Washington, D.C. 20460.

(33 U.S.C. 1412 and 1418.)

Dated: December 30, 1976.

RUSSELL E. TRAIN,
Administrator.

Subchapter H of Chapter I of Title 40 is hereby amended to read as follows:

SUBCHAPTER H—OCEAN DUMPING

Part
220 General.
221 Applications for Ocean Dumping Permits under section 102 of the Act.
222 Action on Ocean Dumping Permit applications under section 102 of the Act.
223 Contents of permits.
224 Records and reports required of ocean dumping permittees under section 102 of the Act.
225 Corps of Engineers Dredged Material Permits.
226 Enforcement.
227 Criteria for the evaluation of permit applications for ocean dumping of materials.
228 Criteria for the management of disposal sites for ocean dumping.
229 General permits.

PART 220—GENERAL

Sec.
220.1 Purpose and scope.
220.2 Definitions.
220.3 Categories of permits.
220.4 Authorities to issue permits.

AUTHORITY: 33 U.S.C. 1412 and 1418.

§ 220.1 Purpose and scope.

(a) *General.* This Subchapter H establishes procedures and criteria for the issuance of permits by EPA pursuant to section 102 of the Act. This Subchapter H also establishes the criteria to be applied by the Corps of Engineers in its review of activities involving the transportation of dredged material for the purpose of dumping it in ocean waters pursuant to section 103 of the Act. Except as may be authorized by a permit issued pursuant to this Subchapter H, or pursuant to section 103 of the Act, and subject to other applicable regulations promulgated pursuant to section 108 of the Act:

(1) No person shall transport from the United States any material for the purpose of dumping it into ocean waters;

(2) In the case of a vessel or aircraft registered in the United States or flying the United States flag or in the case of a United States department, agency, or in-

strumentality, no person shall transport from any location any material for the purpose of dumping it into ocean waters; and

(3) No person shall dump any material transported from a location outside the United States:

(i) Into the territorial sea of the United States; or

(ii) Into a zone contiguous to the territorial sea of the United States, extending to a line twelve nautical miles seaward from the base line from which the breadth of the territorial sea is measured, to the extent that it may affect the territorial sea or the territory of the United States.

(b) *Relationship to international agreements.* In accordance with section 102(a) of the Act, the regulations and criteria included in this Subchapter H apply the standards and criteria binding upon the United States under the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter to the extent that application of such standards and criteria do not relax the requirements of the Act.

(c) *Exclusions.* (1) *Fish wastes.* This Subchapter H does not apply to, and no permit hereunder shall be required for, the transportation for the purpose of dumping or the dumping in ocean waters of fish wastes unless such dumping occurs in:

(i) Harbors or other protected or enclosed coastal waters; or

(ii) Any other location where the Administrator finds that such dumping may reasonably be anticipated to endanger health, the environment or ecological systems.

(2) *Fisheries resources.* This Subchapter H does not apply to, and no permit hereunder shall be required for, the placement or deposit of oyster shells or other materials for the purpose of developing, maintaining or harvesting fisheries resources; provided, such placement or deposit is regulated under or is a part of an authorized State or Federal program certified to EPA by the agency authorized to enforce the regulation, or to administer the program, as the case may be; and provided further, that the National Oceanic and Atmospheric Administration, the U.S. Coast Guard, and the U.S. Army Corps of Engineers concur in such placement or deposit as it may affect their responsibilities and such concurrence is evidenced by letters of concurrence from these agencies.

(3) *Vessel propulsion and fixed structures.* This Subchapter H does not apply to, and no permit hereunder shall be required for:

(i) Routine discharges of effluent incidental to the propulsion of vessels or the operation of motor-driven equipment on vessels; or

(ii) Construction of any fixed structure or artificial island, or the intentional placement of any device in ocean waters or on or in the submerged land beneath such waters, for a purpose other than disposal when such construction or such placement is otherwise regulated by Federal or State law or made pursuant to an authorized Federal or State program certified to EPA by the agency authorized to enforce the regulations or to administer the program, as the case may be.

(4) *Emergency to safeguard life at sea.* This Subchapter H does not apply to, and no permit hereunder shall be required for, the dumping of material into ocean waters from a vessel or aircraft in an emergency to safeguard life at sea to the extent that the person owning or operating such vessel or aircraft files timely reports required by § 224.2(b).

§ 220.2 Definitions.

As used in this Subchapter H:

(a) "Act" means the Marine Protection, Research, and Sanctuaries Act of 1972, as amended (33 U.S.C. 1401);

(b) "FWPCA" means the Federal Water Pollution Control Act, as amended (33 U.S.C. 1251);

(c) "Ocean" or "ocean waters" means those waters of the open seas lying seaward of the baseline from which the territorial sea is measured, as provided for in the Convention on the Territorial Sea and the Contiguous Zone (15 UST 1606; TIAS 5639); this definition includes the waters of the territorial sea, the contiguous zone and the oceans as defined in section 502 of the FWPCA.

(d) "Material" means matter of any kind or description, including, but not limited to, dredged material, solid waste, incinerator residue, garbage, sewage, sewage sludge, munitions, radiological, chemical, and biological warfare agents, radioactive materials, chemicals, biological and laboratory waste, wreck or discarded equipment, rock, sand, excavation debris, industrial, municipal, agricultural, and other waste, but such term does not mean sewage from vessels within the meaning of section 312 of the FWPCA. Oil within the meaning of section 311 of the FWPCA shall constitute "material" for purposes of this Subchapter H only to the extent that it is taken on board a vessel or aircraft for the primary purpose of dumping.

(e) "Dumping" means a disposition of material: Provided, That it does not mean a disposition of any effluent from any outfall structure to the extent that such disposition is regulated under the provisions of the FWPCA, under the provisions of section 13 of the River and Harbor Act of 1899, as amended (33 U.S.C. 407), or under the provisions of the Atomic Energy Act of 1954, as amended (42 U.S.C. 2011), nor does it mean a routine discharge of effluent incidental to the propulsion of, or operation of motor-driven equipment on, vessels: Provided further, That it does not mean the construction of any fixed structure or artificial island nor the intentional placement of any device in ocean waters or on or in the submerged land beneath such waters, for a purpose other than disposal, when such construction or such placement is otherwise regulated by Federal or State law or occurs pursuant to an authorized Federal or State program; And provided further, That it does not include the deposit of oyster shells, or other materials when such deposit is made for the purpose of developing, maintaining, or harvesting fisheries resources and is otherwise regulated by Federal or State law or occurs pursuant to an authorized Federal or State program.

(f) "Sewage Treatment Works" means municipal or domestic waste treatment facilities of any type which are publicly owned or regulated to the extent that feasible compliance schedules are determined by the availability of funding provided by Federal, State, or local governments.

(g) "Criteria" means the criteria set forth in Part 227 of this Subchapter H.

(h) "Dredged Material Permit" means a permit issued by the Corps of Engineers under section 103 of the Act (see 33 CFR 209.120) and any Federal projects reviewed under section 103(e) of the Act (see 33 CFR 209.145).

(i) Unless the context otherwise requires, all other terms shall have the meanings assigned to them by the Act.

§ 220.3 Categories of permits.

This § 220.3 provides for the issuance of general, special, emergency, interim and research permits for ocean dumping under section 102 of the Act.

(a) *General permits.* General permits may be issued for the dumping of certain materials which will have a minimal adverse environmental impact and are generally disposed of in small quantities, or for specific classes of materials that must be disposed of in emergency situations. General permits may be issued on application of an interested person in accordance with the procedures of Part 221 or may be issued without such application whenever the Administrator determines that issuance of a general permit is necessary or appropriate.

(b) *Special permits.* Special permits may be issued for the dumping of materials which satisfy the criteria and shall specify an expiration date no later than three years from the date of issue.

(c) *Emergency permits.* For any of the materials listed in § 227.6, except as trace contaminants, after consultation with the Department of State with respect to the need to consult with parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter that are likely to be affected by the dumping, emergency permits may be issued to dump such materials where there is demonstrated to exist an emergency requiring the dumping of such materials, which poses an unacceptable risk relating to human health and admits of no other feasible solution. As used herein, "emergency" refers to situations requiring action with a marked degree of urgency, but is not limited in its application to circumstances requiring immediate action. Emergency permits may be issued for other materials, except those prohibited by § 227.5, without consultation with the Department of State when the Administrator determines that there exists an emergency requiring the dumping of such materials which poses an unacceptable risk to human health and admits of no other feasible solution.

(d) *Interim permits.* Prior to April 23, 1978, interim permits may be issued in accordance with Subpart A of Part 227 to dump materials which are not in compliance with the environmental impact criteria of Subpart B of Part 227, or which would cause substantial adverse effects as determined in accordance with the criteria of Subparts D or E of Part 227 or for which an ocean disposal site has not been designated on other than an interim basis pursuant to Part 228 of this Subchapter H; provided, however, no permit may be issued for the ocean dumping of any materials listed in § 227.5, or for any of the materials listed in § 227.6, except as trace contaminants; provided further that the compliance date of April 23, 1978, does not apply to the dumping of wastes by existing dumpers when the Regional Administrator determines that the permittee has exercised his best efforts to comply with all requirements of a special permit by April 23, 1978, and has an implementation schedule adequate to allow phasing out of ocean dumping or compliance with all requirements necessary to receive a special permit by December 31, 1981, at the latest. No interim permit will be granted for the dumping of waste from a facility which has not previously dumped wastes in the ocean (except when the facility is operated by a municipality now dumping such wastes), from a new facility, or for the dumping of an increased amount of waste from the expansion or modification of an existing facility, after the effective date of these regulations. No interim permit will be issued for the dumping of any material in the ocean for which an interim permit had previously been issued unless the applicant demonstrates that he has exercised his best efforts to comply with all provisions of the previously issued permits.

(e) *Research permits.* Research permits may be issued for the dumping of any materials, other than materials specified in § 227.5 or for any of the materials listed in § 227.6 except as trace contaminants, unless subject to the exclusion of § 227.6(g), into the ocean as part of a research project when it is determined that the scientific merit of the proposed project outweighs the potential environmental or other damage that may result from the dumping. Research permits shall specify an expiration date no later than 18 months from the date of issue.

(f) *Permits for incineration at sea.* Permits for incineration of wastes at sea will be issued only as research permits or as interim permits until specific criteria to regulate this type of disposal are promulgated, except in those cases where studies on the waste, the incineration method and vessel, and the site have been conducted and the site has been designated for incineration at sea in accordance with the procedures of § 228.4(b). In all other respects the requirements of Parts 220–228 apply.

§ 220.4 Authorities to issue permits.

(a) *Determination by Administrator.* The Administrator, or such other EPA employee as he may from time to time designate in writing, shall issue, deny, modify, revoke, suspend, impose conditions on, initiate and carry out enforcement activities and take any and all other actions necessary or proper and permitted by law with respect to general, special, emergency, interim, or research permits.

(b) *Authority delegated to Regional Administrators.* Regional Administrators, or such other EPA employees as they may from time to time designate in writing, are delegated the authority to issue, deny, modify, revoke, suspend, impose conditions on, initiate and carry out enforcement activities, and take any and all other actions necessary or proper and permitted by law with respect to special and interim permits for:

(1) The dumping of material in those portions of the territorial sea which are subject to the jurisdiction of any State within their respective Regions, and in those portions of the contiguous zone immediately adjacent to such parts of the territorial sea; and in the oceans with respect to approved waste disposal sites designated pursuant to Part 228 of this Subchapter H, and

(2) Where transportation for dumping is to originate in one Region and dumping is to occur at a location within another Region's jurisdiction conferred by order of the Administrator, the Region in which transportation is to originate shall be responsible for review of the application and shall prepare the technical evaluation of the need for dumping and alternatives to ocean dumping. The Region having jurisdiction over the proposed dump site shall take all other actions required by this Subchapter H with respect to the permit application, including without limitation, determining to issue or deny the permit, specifying the conditions to be imposed, and giving public notice. If both Regions do not concur in the disposition of the permit application, the Administrator will make the final decision on all issues with respect to the permit application, including without limitation, issuance or denial of the permit and the conditions to be imposed.

(c) *Review of Corps of Engineers Dredged Material Permits.* Regional Administrators have the authority to review, to approve or to disapprove or to propose conditions upon Dredged Material Permits for ocean dumping of dredged material at locations within the respective Regional jurisdictions. Regional jurisdiction to act under this paragraph (c) of § 220.4 is determined by the Administrator in accordance with § 228.4(e).

PART 221—APPLICATIONS FOR OCEAN DUMPING PERMITS UNDER SECTION 102 OF THE ACT

Sec.
221.1 Applications for permits.
221.2 Other information.
221.3 Applicant.
221.4 Adequacy of information in application.
221.5 Processing fees.

AUTHORITY: 33 U.S.C. 1412 and 1418.

§ 221.1 Applications for permits.

Applications for general, special, emergency, interim and research permits under section 102 of the Act may be filed with the Administrator or the appropriate Regional Administrator, as the case may be, authorized by Section 220.4 to act on the application. Applications shall be made in writing and shall contain, in addition to any other material which may be required, the following:

(a) Name and address of applicant;

(b) Name of the person or firm transporting the material for dumping, the name of the person(s) or firm(s) producing or processing all materials to be transported for dumping, and the name or other identification, and usual location, of the conveyance to be used in the transportation and dumping of the material to be dumped, including information on the transporting vessel's communications and navigation equipment;

(c) Adequate physical and chemical description of material to be dumped, including results of tests necessary to apply the Criteria, and the number, size, and physical configuration of any containers to be dumped;

(d) Quantity of material to be dumped;

(e) Proposed dates and times of disposal;

(f) Proposed dump site, and in the event such proposed dump site is not a dump site designated in this Subchapter H, detailed physical, chemical and biological information relating to the proposed dump site and sufficient to support its designation as a site according to the procedures of Part 228 of this Subchapter H;

(g) Proposed method of releasing the material at the dump site and means by which the disposal rate can be controlled and modified as required;

(h) Identification of the specific process or activity giving rise to the production of the material;

(i) Description of the manner in which the type of material proposed to be dumped has been previously disposed of by or on behalf of the person(s) or firm(s) producing such material;

(j) A statement of the need for the proposed dumping and an evaluation of short and long term alternative means of disposal, treatment or recycle of the material. Means of disposal shall include without limitation, landfill, well injection, incineration, spread of material over open ground; biological, chemical or physical treatment; recovery and recycle of material within the plant or at other plants which may use the material, and storage. The statement shall also include an analysis of the availability and environmental impact of such alternatives; and

(k) An assessment of the anticipated environmental impact of the proposed dumping, including without limitation, the relative duration of the effect of the proposed dumping on the marine environment, navigation, living and non-living marine resource exploitation, scientific study, recreation and other uses of the ocean.

§ 221.2 Other information.

In the event the Administrator, Regional Administrator, or a person designated by either to review permit applications, determines that additional information is needed in order to apply the Criteria, he shall so advise the applicant in writing. All additional information requested pursuant to this § 221.2 shall be deemed part of the application and for purposes of applying the time limitation of §222.1, the application will not be considered complete until such information has been filed.

§ 221.3 Applicant.

Any person may apply for a permit under this Subchapter H even though the proposed dumping may be carried on by a permittee who is not the applicant; provided however, that the Administrator or the Regional Administrator, as the case may be, may, in his discretion, require that an application be filed by the person or firm producing or processing the material proposed to be dumped. Issuance of a permit will not excuse the permittee from any civil or criminal liability which may attach by virtue of his having transported or dumped materials in violation of the terms or conditions of a permit, notwithstanding that the permittee may not have been the applicant.

§ 221.4 Adequacy of information in application.

No permit issued under this Subchapter H will be valid for the transportation or dumping of any material which is not accurately and adequately described in the application. No permittee shall be relieved of any liability which may arise as a result of the transportation or dumping of material which does not conform to information provided in the application solely by virtue of the fact that such information was furnished by an applicant other than the permittee.

§ 221.5 Processing fees.

(a) A processing fee of $1,000 will be charged in connection with each application for a permit for dumping in an existing dump site designated in this Subchapter H.

(b) A processing fee of an additional $3,000 will be charged in connection with each application for a permit for dumping in a dump site other than a dump site designated in this Subchapter H.

(c) Notwithstanding any other provision of this § 221.5, no agency or instrumentality of the United States or of a State or local government will be required to pay the processing fees specified in paragraphs (a) and (b) of this section.

PART 222—ACTION ON OCEAN DUMPING PERMIT APPLICATIONS UNDER SECTION 102 OF THE ACT

Sec.

222.1 General.
222.2 Tentative determinations.
222.3 Notice of applications.
222.4 Initiation of hearings.
222.5 Time and place of hearings.
222.6 Presiding Officer.
222.7 Conduct of public hearing.
222.8 Recommendations of Presiding Officer.
222.9 Issuance of permits.
222.10 Appeal to adjudicatory hearing.
222.11 Conduct of adjudicatory hearings.
222.12 Appeal to Administrator.
222.13 Computation of time.

AUTHORITY: 33 U.S.C. 1412 and 1418.

§ 222.1 General.

Decisions as to the issuance, denial, or imposition of conditions on general, special, emergency, interim and research permits under section 102 of the Act will be made by application of the criteria of Parts 227 and 228. Final action on any application for a permit will, to the extent practicable, be taken within 180 days from the date a complete application is filed.

§ 222.2 Tentative determinations.

(a) Within 30 days of the receipt of his initial application, an applicant shall be issued notification of whether his application is complete and what, if any, additional information is required. No such notification shall be deemed to foreclose the Administrator or the Regional Administrator, as the case may be, from requiring additional information at any time pursuant to § 221.2.

(b) Within 30 days after receipt of a completed permit application, the Administrator or the Regional Administrator, as the case may be, shall publish notice of such application including a tentative determination with respect to issuance or denial of the permit. If such tentative determination is to issue the permit, the following additional tentative determinations will be made:

(1) Proposed time limitations, if any;

(2) Proposed rate of discharge from the barge or vessel transporting the waste;

(3) Proposed dumping site; and

(4) A brief description of any other proposed conditions determined to be appropriate for inclusion in the permit in question.

§ 222.3 Notice of applications.

(a) *Contents.* Notice of every complete application for a general, special, interim, emergency and research permit shall, in addition to any other material, include the following:

(1) A summary of the information included in the permit application;

(2) Any tentative determinations made pursuant to paragraph (b) of § 222.2;

(3) A brief description of the procedures set forth in § 222.5 for requesting a public hearing on the application including specification of the date by which requests for a public hearing must be filed;

(4) A brief statement of the factors considered in reaching the tentative determination with respect to the permit and, in the case of a tentative determination to issue the permit, the reasons for the choice of the particular permit conditions selected; and

(5) The location at which interested persons may obtain further information on the proposed dumping, including copies of any relevant documents.

(b) *Publication.*

(1) *Special, interim and research permits.* Notice of every complete application for special, interim and research permits shall be given by:

(i) Publication in a daily newspaper of general circulation in the State in closest proximity to the proposed dump site; and

(ii) Publication in a daily newspaper of general circulation in the city in which is located the office of the Administrator or the Regional Administrator, as the case may be, giving notice of the permit application.

(2) *General permits.* Notice of every complete application for a general permit or notice of action proposed to be taken by the Administrator to issue a general permit, without an application, shall be given by publication in the FEDERAL REGISTER.

(3) *Emergency permits.* Notice of every complete application for an emergency permit shall be given by publication in accordance with paragraphs (b)(1) (i) and (ii) of this section; provided, however, that no such notice and no tentative determination in accordance with § 222.2 shall be required in any case in which the Administrator determines:

(i) That an emergency, as defined in paragraph (c) of § 220.3 exists;

(ii) That the emergency poses an unacceptable risk relating to human health;

(iii) That the emergency admits of no other feasible solution; and

(iv) That the public interest requires the issuance of an emergency permit as soon as possible.

Notice of any determination made by the Administrator pursuant to this paragraph (b)(3) shall be given as soon as practicable after the issuance of the emergency permit by publication in accordance with paragraphs (b)(1) (i) and (ii) and with paragraphs (a), (c)-(i) of this section.

(c) *Copies of notice sent to specific persons.* In addition to the publication of notice required by paragraph (b) of this section, copies of such notice will be mailed by the Administrator or the Regional Administrator, as the case may be, to any person, group or Federal, State or local agency upon request. Any such request may be a standing request for copies of such notices and shall be submitted in writing to the Administrator or to any Regional Administrator and shall relate to all or any class of permit applications which may be acted upon by the Administrator or such Regional Administrator, as the case may be.

(d) *Copies of notice sent to States.* In addition to the publication of notice required by paragraph (b) of this section, copies of such notice will be mailed to the State water pollution control agency and to the State agency responsible for carrying out the Coastal Zone Management Act, if such agency exists, for each coastal State within 500 miles of the proposed dumping site.

(e) *Copies of notice sent to Corps of Engineers.* In addition to the publication of notice required by paragraph (b) of this section, copies of such notice will be mailed to the office of the appropriate District Engineer of the U.S. Army Corps of Engineers for purposes of section 106 (c) of the Act (pertaining to navigation, harbor approaches, and artificial islands on the outer continental shelf).

(f) *Copies of notice sent to Coast Guard.* In addition to the publication of notice required by paragraph (b) of this section, copies of such notice will be sent to the appropriate district office of the U.S. Coast Guard for review and possible suggestion of additional conditions to be included in the permit to facilitate surveillance and enforcement.

(g) *Fish and Wildlife Coordination Act.* The Fish and Wildlife Coordination Act, Reorganization Plan No. 4 of 1970, and the Act require that the Administrator or the Regional Administrator, as the case may be, consult with appropriate regional officials of the Departments of Commerce and Interior, the Regional Director of the NMFS–NOAA, and the agency exercising administrative jurisdiction over the fish and wildlife resources of the States subject to any dumping prior to the issuance of a permit under this Subchapter H. Copies of the notice shall be sent to the persons noted in paragraph (g) of this section.

(h) *Copies of notice sent to Food and Drug Administration.* In addition to the publication of notice required by paragraph (b) of this section, copies of such notice will be mailed to Food and Drug Administration, Shellfish Sanitation Branch (HF–417), 200 C Street SW., Washington, D.C. 20204.

(i) *Failure to give certain notices.* Failure to send copies of any public notice in accordance with paragraphs (c) through (h) of this section shall not invalidate any notice given pursuant to this section nor shall such failure invalidate any subsequent administrative proceeding.

(j) *Failure of consulted agency to respond.* Unless advice to the contrary is received from the appropriate Federal or State agency within 30 days of the date copies of any public notice were dispatched to such agency, such agency will be deemed to have no objection to the issuance of the permit identified in the public notice.

§ 222.4 Initiation of hearings

(a) In the case of any permit application for which public notice in advance of permit issuance is required in accordance with paragraph (b) of § 222.3, any person may, within 30 days of the date on which all provisions of paragraph (b) of § 222.3 have been complied with, request a public hearing to consider the issuance or denial of, or the conditions to be imposed upon, such permit. Any such request for a public hearing shall be in writing, shall identify the person requesting the hearing, shall state with particularity any objections to the issuance or denial of, or to the conditions to be imposed upon, the proposed permit, and shall state the issues which are proposed to be raised by such person for consideration at a hearing.

(b) Whenever (1) a written request satisfying the requirements of paragraph (a) of this section has been received and the Administrator or Regional Administrator, as the case may be, determines that such request presents genuine issues, or (2) the Administrator or Regional Administrator, as the case may be, determines in his discretion that a public hearing is necessary or appropriate, the Administrator or the Regional Administrator, as the case may be, will set a time and place for a public hearing in accordance with § 222.5, and will give notice of such hearing by publication in accordance with § 222.3.

(c) In the event the Administrator or the Regional Administrator, as the case may be, determines that a request filed pursuant to paragraph (a) of this section does not comply with the requirements of such paragraph (a) or that such request does not present substantial issues of public interest, he shall advise, in writing, the person requesting the hearing of his determination.

§ 222.5 Time and place of hearings.

Hearings shall be held in the State in closest proximity to the proposed dump site, whenever practicable, and shall be set for the earliest practicable date no less than 30 days after the receipt of an appropriate request for a hearing or a determination by the Administrator or the Regional Administrator, as the case may be, to hold such a hearing without such a request.

§ 222.6 Presiding Officer.

A hearing convened pursuant to this Subchapter H shall be conducted by a Presiding Officer. The Administrator or Regional Administrator, as the case may be, may designate a Presiding Officer. For adjudicatory hearings held pursuant to § 222.11, the Presiding Officer shall be an Administrative Law Judge.

§ 222.7 Conduct of public hearing.

The Presiding Officer shall be responsible for the expeditious conduct of the hearing. The hearing shall be an informal public hearing, not an adversary proceeding, and shall be conducted so as to allow the presentation of public comments. When the Presiding Officer determines that it is necessary or appropriate, he shall cause a suitable record, which may include a verbatim transcript, of the proceedings to be made. Any person may appear at a public hearing convened pursuant to § 222.5 whether or not he requested the hearing, and may be represented by counsel or any other authorized representative. The Presiding Officer is authorized to set forth reasonable restrictions on the nature or amount of documentary material or testimony presented at a public hearing, giving due regard to the relevancy of any such information, and to the avoidance of undue repetitiveness of information presented.

§ 222.8 Recommendations of Presiding Officer.

Within 30 days following the adjournment of a public hearing convened pursuant to § 222.5, or within such additional period as the Administrator or the Regional Administrator, as the case may be, may grant to the Presiding Officer for good cause shown, and after full consideration of the comments received at the hearing, the Presiding Officer will prepare and forward to the Administrator or to the Regional Administrator, as the case may be, written recommendations relating to the issuance or denial of, or conditions to be imposed upon, the proposed permit and the record of the hearing, if any. Such recommendations shall contain a brief statement of the basis for the recommendations including a description of evidence relied upon in justification either (1) for permit provisions which differ from any tentative determinations issued prior to the hearing or (2) for any permit denial. Copies of the Presiding Officer's recommendations shall be provided to any interested person on request, without charge. Copies of the record will be provided in accordance with 40 CFR 2.

§ 222.9 Issuance of permits.

(a) Within 30 days following receipt of the Presiding Officer's recommendations or, where no hearing has been held, following the close of the 30-day period for requesting a hearing as provided in § 222.4, the Administrator or the Regional Administrator, as the case may be, shall make a determination with respect to the issuance, denial, or imposition of conditions on, any permit applied for under this Subchapter H and shall give notice to the applicant and to all persons who registered their attendance at the hearing by providing their name and mailing address, if any, by mailing a letter stating the determination and stating the basis therefor in terms of the Criteria.

(b) Any determination to issue or deny any permit after a hearing held pursuant to § 222.7 shall take effect no sooner than:

(1) 10 days after notice of such determination is given if no request for an adjudicatory hearing is filed in accordance with § 222.10(a); or

(2) 20 days after notice of such determination is given if a request for an adjudicatory hearing is filed in accordance with paragraph (a) of § 222.10 and the Administrator or the Regional Administrator, as the case may be, denies such request in accordance with paragraph (c) of § 222.10; or

(3) The date on which a final determination has been made following an

adjudicatory hearing held pursuant to § 222.11.

(c) The Administrator or Regional Administrator, as the case may be, may extend the term of a previously issued permit pending the conclusion of the proceedings held pursuant to §§ 222.7–222.9.

(d) A copy of each permit issued shall be sent to the appropriate District Office of the U.S. Coast Guard.

§ 222.10 Appeal to adjudicatory hearing.

(a) Within 10 days following the receipt of notice of the issuance or denial of any permit pursuant to § 222.9 after a hearing held pursuant to § 222.7, any interested person who participated in such hearing may request that an adjudicatory hearing be held pursuant to § 222.11 for the purpose of reviewing such determination, or any part thereof. Any such request for an adjudicatory hearing shall be filed with the Administrator or the Regional Administrator, as the case may be, and shall be in writing, shall identify the person requesting the adjudicatory hearing and shall state with particularity the objections to the determination, the basis therefor and the modification requested.

(b) Whenever a written request satisfying the requirements of paragraph (a) of this section has been received and the Administrator or Regional Administrator, as the case may be, determines that an adjudicatory hearing is warranted, the Administrator or the Regional Administrator, as the case may be, will set a time and place for an adjudicatory hearing in accordance with § 222.5, and will give notice of such hearing by publication in accordance with § 222.3.

(c) Prior to the conclusion of the adjudicatory hearing and appeal process, the Administrator or the Regional Administrator, as the case may be, in his discretion may extend the duration of a previously issued permit until a final determination has been made pursuant to §§ 222.11 or 222.12.

(d) In the event the Administrator or the Regional Administrator, as the case may be, determines that a request filed pursuant to paragraph (a) of this section does not comply with the requirements of such paragraph (a) or that such request does not present substantial issues of public interest, he shall advise, in writing, the person requesting the adjudicatory hearing of his determination.

(e) Any person requesting an adjudicatory hearing or requesting admission as a party to an adjudicatory hearing shall state in his written request, and shall by filing such request consent, that he and his employees and agents shall submit themselves to direct and cross-examination at any such hearing and to the taking of an oath administered by the Presiding Officer.

§ 222.11 Conduct of adjudicatory hearings.

(a) *Parties*. Any interested person may at a reasonable time prior to the commencement of the hearing submit to the Presiding Officer a request to be admitted as a party. Such request shall be in writing and shall set forth the information which would be required to be submitted by such person if he were requesting an adjudicatory hearing. Any such request to be admitted as a party which satisfies the requirements of this paragraph (a) shall be granted and all parties shall be informed at the commencement of the adjudicatory hearing of the parties involved. Any party may be represented by counsel or other authorized representative. EPA staff representing the Administrator or Regional Administrator who took action with respect to the permit application shall be deemed a party.

(b) *Filing and service*.

(1) An original and two (2) copies of all documents or papers required or permitted to be filed shall be filed with the Presiding Officer.

(2) Copies of all documents and papers filed with the Presiding Officer shall be served upon all other parties to the adjudicatory hearing.

(c) *Consolidation*. The Administrator, or the Regional Administrator in the case of a hearing arising within his Region and for which he has been delegated authority hereunder, may, in his discretion, order consolidation of any adjudicatory hearings held pursuant to this section whenever he determines that consolidation will expedite or simplify the consideration of the issues presented. The Administrator may, in his discretion, order consolidation and designate one Region to be responsible for the conduct of any hearings held pursuant to this section which arise in different Regions whenever he determines that consolidation will expedite or simplify the consideration of the issues presented.

(d) *Pre-hearing conference*. The Presiding Officer may hold one or more prehearing conferences and may issue a pre-hearing order which may include without limitation, requirements with respect to any or all of the following:

(1) Stipulations and admissions;

(2) Disputed issues of fact;

(3) Disputed issues of law;

(4) Admissibility of any evidence;

(5) Hearing procedures including submission of oral or written direct testimony, conduct of cross-examination, and the opportunity for oral arguments;

(6) Any other matter which may expedite the hearing or aid in disposition of any issues raised therein.

(e) *Adjudicatory hearing procedures*.

(1) The burden of going forward with the evidence shall:

(i) In the case of any adjudicatory hearing held pursuant to § 222.10(b)(1), be on the person filing a request under § 222.10(a) as to each issue raised by the request; and

(ii) In the case of any adjudicatory hearing held pursuant to § 223.2 or pursuant to Part 226, be on the Environmental Protection Agency.

(2) The Presiding Officer shall have the duty to conduct a fair and impartial hearing, to take action to avoid unnecessary delay in the disposition of proceedings, and to maintain order. He shall have all powers necessary or appropriate to that end, including without limitation the following:

(i) To administer oaths and affirmations;

(ii) To rule upon offers of proof and receive relevant evidence;

(iii) To regulate the course of the hearing and the conduct of the parties and their counsel;

(iv) To consider and rule upon all procedural and other motions appropriate to the proceedings; and

(v) To take any action authorized by these regulations and in conformance with law.

(3) Parties shall have the right to cross-examine a witness who appears at an adjudicatory hearing to the extent that such cross-examination is necessary or appropriate for a full disclosure of the facts. In multi-party proceedings the Presiding Officer may limit cross-examination to one party on each side if he is satisfied that the cross-examination by one party will adequately protect the interests of other parties.

(4) When a party will not be unfairly prejudiced thereby, the Presiding Officer may order all of part of the evidence to be submitted in written form.

(5) Rulings of the Presiding Officer on the admissibility of evidence, the propriety of cross-examination, and other procedural matters, shall be final and shall appear in the record.

(6) Interlocutory appeals may not be taken.

(7) Parties shall be presumed to have taken exception to an adverse ruling.

(8) The proceedings of all hearings shall be recorded by such means as the Presiding Officer may determine. The original transcript of the hearing shall be a part of the record and the sole official transcript. Copies of the transcript shall be available from the Environmental Protection Agency in accordance with 40 CFR 2.

(9) The rules of evidence shall not apply.

(f) *Decision after adjudicatory hearing*.

(1) Within 30 days after the conclusion of the adjudicatory hearing, or within such additional period as the Administrator or the Regional Administrator, as the case may be, may grant to the Presiding Officer for good cause shown, the Presiding Officer shall submit to the Administrator or the Regional Administrator, as the case may be, proposed findings of fact and conclusions of law, his recommendation with respect to any and all issues raised at the hearing, and the record of the hearing. Such findings, conclusions and recommendations shall contain a brief statement of the basis for the recommendations. Copies of the Presiding Officer's proposed findings of fact, conclusions of law and recommendations shall be provided to all parties to the adjudicatory hearing on request, without charge.

(2) Within 20 days following submission of the Presiding Officer's proposed findings of fact, conclusions of law and recommendations, any party may sub-

mit written exceptions, no more than 30 pages in length, to such proposed findings, conclusions and recommendations and within 30 days following the submission of the Presiding Officer's proposed findings, conclusions and recommendations any party may file written comments, no more than 30 pages in length, on another party's exceptions. Within 45 days following the submission of the Presiding Officer's proposed findings, conclusions and recommendations, the Administrator or the Regional Administrator, as the case may be, shall make a determination with respect to all issues raised at such hearing and shall affirm, reverse or modify the previous or proposed determination, as the case may be. Notice of such determination shall set forth the determination for each such issue, shall briefly state the basis therefor and shall be given by mail to all parties to the adjudicatory hearing.

§ 222.12 Appeal to Administrator.

(a) Within 10 days following receipt of the determination of the Regional Administrator pursuant to paragraph (f)(2) of § 222.11, any party to an adjudicatory hearing held in accordance with § 222.11 may appeal such determination to the Administrator by filing a written notice of appeal, or the Administrator may, on his own initiative, review any prior determination.

(b) The notice of appeal shall be no more than 40 pages in length and shall contain:

(1) The name and address of the person filing the notice of appeal;

(2) A concise statement of the facts on which the person relies and appropriate citations to the record of the adjudicatory hearing;

(3) A concise statement of the legal basis on which the person relies;

(4) A concise statement setting forth the action which the person proposes that the Administrator take; and

(5) A certificate of service of the notice of appeal on all other parties to the adjudicatory hearing.

(c) The effective date of any determination made pursuant to paragraph (f)(2) of § 222.11 may be stayed by the Administrator pending final determination by him pursuant to this section upon the filing of a notice of appeal which satisfies the requirements of paragraph (b) of this section or upon initiation by the Administrator of review of any determination in the absence of such notice of appeal.

(d) Within 20 days following the filing of a notice of appeal in accordance with this section, any party to the adjudicatory hearing may file a written memorandum, no more than 40 pages in length, in response thereto.

(e) Within 45 days following the filing of a notice of appeal in accordance with this section, the Administrator shall render his final determination with respect to all issues raised in the appeal to the Administrator and shall affirm, reverse, or modify the previous determination and briefly state the basis for his determination.

(f) In accordance with 5 U.S.C. section 704, the filing of an appeal to the Administrator pursuant to this section shall be a prerequisite to judicial review of any determination to issue, deny or impose conditions upon any permit, or to modify, revoke or suspend any permit, or to take any other enforcement action, under this Subchapter H.

§ 222.13 Computation of time.

In computing any period of time prescribed or allowed in this part, except unless otherwise provided, the day on which the designated period of time begins to run shall not be included. The last day of the period so computed is to be included unless it is a Saturday, Sunday, or a legal holiday in which the Environmental Protection Agency is not open for business, in which event the period runs until the end of the next day which is not a Saturday, Sunday, or legal holiday. Intermediate Saturdays, Sundays and legal holidays shall be excluded from the computation when the period of time prescribed or allowed is seven days or less.

PART 223—CONTENTS OF PERMITS

Sec.
223.1 Contents of permits.
223.2 Generally applicable conditions of permits.

AUTHORITY: 33 U.S.C. 1412 and 1418.

§ 223.1 Contents of permits.

Permits, other than general permits, which may be issued on forms to be published by EPA and must be displayed on the vessel engaged in dumping, will include at a minimum the following:

(a) Name of permittee;

(b) Means of conveyance and methods and procedures for disposal of material to be dumped; and, in the case of permits for the transportation of material for dumping, the port through or from which such material will be transported;

(c) A complete description, including all relevant chemical and physical properties and quantities, of the material to be dumped;

(d) The disposal site;

(e) The times at which the permitted dumping may occur;

(f) Such monitoring relevant to the assessment of the impact of permitted dumping activities on the marine environment at the disposal site as the Administrator determines is feasible; and

(g) Any other terms and conditions, including those with respect to release procedures, determined to be necessary and adequate in order to conform the permitted dumping activities to the factors set forth in Section 102(a) of the Act, and the criteria set forth in Part 227.

§ 223.2 Generally applicable conditions of permits.

(a) *Modification or revocation.* Any permit issued under this Part shall be subject to modification, or revocation in whole or in part for cause, as follows:

(1) Violation of any term or condition of the permit;

(2) Misrepresentation, inaccuracy, or failure to disclose all relevant facts in the permit application;

(3) Changed circumstances, such as changes in conditions obtaining at the designated dumping site, and newly discovered scientific data relevant to the granting of the permit;

(4) Failure to keep the records, and to notify appropriate officials of dumping activities, as specified in §§ 224.1 and 224.2.

(b) *Suspension.* In addition to the conditions of a permit imposed pursuant to paragraph (a) of this section, each permit shall be subject to suspension by the Administrator or Regional Administrator if he determines that the permitted dumping has resulted, or is resulting, in imminent and substantial harm to human health or welfare or the marine environment. Such suspension shall be effective immediately upon receipt of notification thereof by the permittee.

(c) *Hearings.* Within 30 days after receipt of notice of revocation or modification pursuant to paragraph (a) of this section, or of suspension pursuant to paragraph (b) of this section, a permittee or other interested person may request in writing a hearing on the issues raised by any such revocation or suspension. Upon receipt of any such request, the Administrator or Regional Administrator shall appoint a hearing officer to conduct an adjudicatory hearing as may be required by law and by this subchapter as now or hereafter in effect.

PART 224—RECORDS AND REPORTS REQUIRED OF OCEAN DUMPING PERMITTEES UNDER SECTION 102 OF THE ACT

Sec.
224.1 Records of permittees.
224.2 Reports.

AUTHORITY: 33 U.S.C. 1412 and 1418.

§ 224.1 Records of permittees.

Each permittee named in a special, interim, emergency or research permit under section 102 of the Act and each person availing himself of the privilege conferred by a general permit, shall maintain complete records of the following information, which will be available for inspection by the Administrator, Regional Administrator, the Commandant of the U.S. Coast Guard, or their respective designees:

(a) The physical and chemical characteristics of the material dumped pursuant to the permit;

(b) The precise times and locations of dumping;

(c) Any other information required as a condition of a permit by the Administrator or the Regional Administrator, as the case may be.

§ 224.2 Reports.

(a) *Periodic reports.* Information required to be recorded pursuant to § 224.1 shall be reported to the Administrator or the Regional Administrator, as the case may be, for the periods indicated within 30 days of the expiration of such periods:

(1) For each six-month period, if any, following the effective date of the permit;

(2) For any other period of less than six months ending on the expiration date of the permit; and

(3) As otherwise required in the conditions of the permit.

(b) *Reports of emergency dumping.* If material is dumped without a permit pursuant to paragraph (c)(4) of § 220.1, the owner or operator of the vessel or aircraft from which such dumping occurs shall as soon as feasible inform the Administrator, Regional Administrator, or the nearest Coast Guard district of the incident by radio, telephone, or telegraph and shall within 10 days file a written report with the Administrator or Regional Administrator containing the information required under § 224.1 and a complete description of the circumstances under which the dumping occurred. Such description shall explain how human life at sea was in danger and how the emergency dumping reduced that danger. If the material dumped included containers, the vessel owner or operator shall immediately request the U.S. Coast Guard to publish in the local Notice to Mariners the dumping location, the type of containers, and whether the contents are toxic or explosive. Notification shall also be given to the Food and Drug Administration, Shellfish Sanitation Branch, Washington, D.C. 20204, as soon as possible.

PART 225—CORPS OF ENGINEERS DREDGED MATERIAL PERMITS

Sec.
225.1 General.
225.2 Review of Dredged Material Permits.
225.3 Procedure for invoking economic impact.
225.4 Waiver by Administrator.

AUTHORITY: 33 U.S.C. 1412 and 1418.

§ 225.1 General.

Applications and authorizations for Dredged Material Permits under section 103 of the Act for the transportation of dredged material for the purpose of dumping it in ocean waters will be evaluated by the U.S. Army Corps of Engineers in accordance with the criteria set forth in Part 227 and processed in accordance with 33 CFR 209.120 with special attention to § 209.120(g)(17) and 33 CFR 209.145.

§ 225.2 Review of Dredged Material Permits.

(a) The District Engineer shall send a copy of the public notice to the appropriate Regional Administrator, and set forth in writing all of the following information:

(1) The location of the proposed disposal site and its physical boundaries;

(2) A statement as to whether the site has been designated for use by the Administrator pursuant to section 102(c) of the Act;

(3) If the proposed disposal site has not been designated by the Administrator, a statement of the basis for the proposed determination why no previously designated site is feasible and a description of the characteristics of the proposed disposal site necessary for its designation pursuant to Part 228 of this Subchapter H;

(4) The known historical uses of the proposed disposal site;

(5) Existence and documented effects of other authorized dumpings that have been made in the dumping area (e.g., heavy metal background reading and organic carbon content);

(6) An estimate of the length of time during which disposal will continue at the proposed site;

(7) Characteristics and composition of the dredged material; and

(8) A statement concerning a preliminary determination of the need for and/or availability of an environmental impact statement.

(b) The Regional Administrator will within 15 days of the date the public notice and other information required to be submitted by paragraph (a) of § 225.2 are received by him, review the information submitted and request from the District Engineer any additional information he deems necessary or appropriate to evaluate the proposed dumping.

(c) Using the information submitted by the District Engineer, and any other information available to him, the Regional Administrator will within 15 days after receipt of all requested information, make an independent evaluation of the proposed dumping in accordance with the criteria and respond to the District Engineer pursuant to paragraphs (d) or (e) of this section. The Regional Administrator may request an extension of this 15 day period to 30 days from the District Engineer.

(d) When the Regional Administrator determines that the proposed dumping will comply with the criteria, he will so inform the District Engineer in writing.

(e) When the Regional Administrator determines that the proposed dumping will not comply with the criteria he shall so inform the District Engineer in writing. In such cases, no Dredged Material Permit for such dumping shall be issued unless and until the provisions of § 225.3 are followed and the Administrator grants a waiver of the criteria pursuant to § 225.4.

§ 225.3 Procedure for invoking economic impact.

(a) When a District Engineer's determination to issue a Dredged Material Permit for the dumping of dredged material into ocean waters has been rejected by a Regional Administrator upon application of the Criteria, the District Engineer may determine whether, under § 103(d) of the Act, there is an economically feasible alternative method or site available other than the proposed dumping in ocean waters. If the District Engineer makes any such preliminary determination that there is no economically feasible alternative method or site available, he shall so advise the Regional Administrator setting forth his reasons for such determination and shall submit a report of such determination to the Chief of Engineers in accordance with 33 CFR §§ 209.120 and 209.145.

(b) If the decision of the Chief of Engineers is that ocean dumping at the designated site is required because of the unavailability of feasible alternatives, he shall so certify and request that the Secretary of the Army seek a waiver from the Administrator of the Criteria or of the critical site designation in accordance with § 225.4.

§ 225.4 Waiver by Administrator.

The Administrator shall grant the requested waiver unless within 30 days of his receipt of the notice, certificate and request in accordance with paragraph (b) of § 225.3 he determines in accordance with this section that the proposed dumping will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas. Notice of the Administrator's final determination under this section shall be given to the Secretary of the Army.

PART 226—ENFORCEMENT

Sec.
226.1 Civil penalties.
226.2 Enforcement hearings.
226.3 Determinations.
226.4 Final action.

AUTHORITY: 33 U.S.C. 1412 and 1418

§ 226.1 Civil penalties.

In addition to the criminal penalties provided for in section 105(b) of the Act, the Administrator or his designee may assess a civil penalty of not more than $50,000 for each violation of the Act and of this subchapter. Upon receipt of information that any person has violated any provision of the Act or of this subchapter, the Administrator or his designee will notify such person in writing of the violation with which he is charged, and will convene a hearing no sooner than 60 days after such notice, at a convenient location, before a hearing officer. Such hearing shall be conducted in accordance with the procedures of § 226.2.

§ 226.2 Enforcement hearings.

Hearings convened pursuant to § 226.1 shall be hearings on a record before a hearing officer. Parties may be represented by counsel and will have the right to submit motions, to present evidence in their own behalf, to cross-examine adverse witnesses, to be apprised of all evidence considered by the hearing officer and to receive copies of the transcript of the proceedings. Formal rules of evidence will not apply. The hearing officer will rule on all evidentiary matters, and on all motions, which will be subject to review pursuant to § 226.3.

§ 226.3 Determinations.

Within 30 days following adjournment of the hearing, the hearing officer will in all cases make findings of facts and recommendations to the Administrator including, when appropriate, a recommended appropriate penalty, after consideration of the gravity of the violation, prior violations by the person charged, and the demonstrated good faith by such person in attempting to achieve rapid compliance with the provisions of the Act and this subchapter. A copy of the findings and recommendations of the hearing officer shall be provided to the person charged at the same time they are forwarded to the Administrator. Within 30 days of the date on which the hearing officer's findings and recommendations are forwarded to the Administrator, any party objecting thereto may file written exceptions with the Administrator.

§ 226.4 Final action.

A final order on a proceeding under this Part will be issued by the Administrator, or by such other person designated by the Administrator to take such final action, no sooner than 30 days following receipt of the findings and recommendations of the hearing officer. A copy of the final order will be served by registered mail (return receipt requested) on the person charged or his representative. In the event the final order assesses a penalty, it shall be payable within 60 days of the date of receipt of the final order, unless judicial review of the final order is sought by the person against whom the penalty is assessed.

PART 227—CRITERIA FOR THE EVALUATION OF PERMIT APPLICATIONS FOR OCEAN DUMPING OF MATERIALS

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Subpart A—General

§ 227.1 Applicability.

(a) Section 102 of the Act requires that criteria for the issuance of ocean disposal permits be promulgated after consideration of the environmental effect of the proposed dumping operation, the need for ocean dumping, alternatives to ocean dumping, and the effect of the proposed action on esthetic, recreational and economic values and on other uses of the ocean. This Part 227 and Part 228 of this Subchapter H together constitute the criteria established pursuant to section 102 of the Act. The decision of the Administrator, Regional Administrator or the District Engineer, as the case may be, to issue or deny a permit and to impose specific conditions on any permit issued will be based on an evaluation of the permit application pursuant to the criteria set forth in this Part 227 and upon the requirements for disposal site management pursuant to the criteria set forth in Part 228 of this Subchapter H.

(b) With respect to the criteria to be used in evaluating disposal of dredged materials, this section and Subparts C, D, E, and G apply in their entirety. To determine whether the proposed dumping of dredged material complies with Subpart B, only §§ 227.4, 227.5, 227.6, 227.9, 227.10 and 227.13 apply. An applicant for a permit to dump dredged material must comply with all of Subparts C, D, E, G and applicable sections of B, to be deemed to have met the EPA criteria for dredged material dumping promulgated pursuant to section 102(a) of the Act. If, in any case, the Chief of Engineers finds that, in the disposition of dredged material, there is no economically feasible method or site available other than a dumping site, the utilization of which would result in noncompliance with the criteria established pursuant to Subpart B relating to the effects of dumping or with the restrictions established pursuant to section 102(c) of the Act relating to critical areas, he shall so certify and request that the Secretary of the Army seek a waiver from the Administrator pursuant to Part 225.

(c) The Criteria of this Part 227 are established pursuant to section 102 of the Act and apply to the evaluation of proposed dumping of materials under Title I of the Act. The Criteria of this Part 227 deal with the evaluation of proposed dumping of materials on a case-by-case basis from information supplied by the applicant or otherwise available to EPA or the Corps of Engineers concerning the characteristics of the waste and other considerations relating to the proposed dumping.

(d) After consideration of the provisions of §§ 227.28 and 227.29, no permit will be issued when the dumping would result in a violation of applicable water quality standards.

§ 227.2 Materials which satisfy the environmental impact criteria of Subpart B.

(a) If the applicant satisfactorily demonstrates that the material proposed for ocean dumping satisfies the environmental impact criteria set forth in Subpart B, a permit for ocean dumping will be issued unless:

(1) There is no need for the dumping, and alternative means of disposal are available, as determined in accordance with the criteria set forth in Subpart C; or

(2) There are unacceptable adverse effects on esthetic, recreational or economic values as determined in accordance with the criteria set forth in Subpart D; or

(3) There are unacceptable adverse effects on other uses of the ocean as determined in accordance with the criteria set forth in Subpart E.

(b) If the material proposed for ocean dumping satisfies the environmental impact criteria set forth in Subpart B, but the Administrator or the Regional Administrator, as the case may be, determines that any one of the considerations set forth in paragraphs (a) (1), (2) or (3) of this section applies, he will deny the permit application; provided however, that he may issue an interim permit for ocean dumping pursuant to paragraph (d) of § 220.3 and Subpart F of this Part 227 when he determines that:

(1) The material proposed for ocean dumping does not contain any of the materials listed in § 227.5 or listed in § 227.6, except as trace contaminants; and

(2) In accordance with Subpart C there is a need to ocean dump the material and no alternatives are available to such dumping; and

(3) The need for the dumping and the unavailability of alternatives, as determined in accordance with Subpart C, are of greater significance to the public interest than the potential for adverse effect on esthetic, recreational or economic values, or on other uses of the ocean, as determined in accordance with Subparts D and E, respectively.

§ 227.3 Materials which do not satisfy the environmental impact criteria set forth in Subpart B.

If the material proposed for ocean dumping does not satisfy the environmental impact criteria of Subpart B, the Administrator or the Regional Administrator, as the case may be, will deny the permit application; provided however, that he may issue an interim permit pursuant to paragraph (d) of § 220.3 and

Subpart F of this Part 227 when he determines that:

(a) The material proposed for dumping does not contain any of the materials listed in Section 227.6 except as trace contaminants, or any of the materials listed in § 227.5;

(b) In accordance with Subpart C there is a need to ocean dump the material; and

(c) Any one of the following factors is of greater significance to the public interest than the potential for adverse impact on the marine environment as determined in accordance with Subpart B:

(1) The need for the dumping, as determined in accordance with Subpart C; or

(2) The adverse effects of denial of the permit on recreational or economic values as determined in accordance with Subpart D; or

(3) The adverse effects of denial of the permit on other uses of the ocean, as determined in accordance with Subpart E.

Subpart B—Environmental Impact

§ 227.4 Criteria for evaluating environmental impact.

This Subpart B sets specific environmental impact prohibitions, limits, and conditions for the dumping of materials into ocean waters. If the applicable prohibitions, limits, and conditions are satisfied, it is the determination of EPA that the proposed disposal will not unduly degrade or endanger the marine environment and that the disposal will present:

(a) No unacceptable adverse effects on human health and no significant damage to the resources of the marine environment;

(b) No unacceptable adverse effect on the marine ecosystem;

(c) No unacceptable adverse persistent or permanent effects due to the dumping of the particular volumes or concentrations of these materials; and

(d) No unacceptable adverse effect on the ocean for other uses as a result of direct environmental impact.

§ 227.5 Prohibited materials.

The ocean dumping of the following materials will not be approved by EPA or the Corps of Engineers under any circumstances:

(a) High-level radioactive wastes as defined in § 227.30;

(b) Materials in whatever form (including without limitation, solids, liquids, semi-liquids, gases or organisms) produced or used for radiological, chemical or biological warfare;

(c) Materials insufficiently described by the applicant in terms of their compositions and properties to permit application of the environmental impact criteria of this Subpart B;

(d) Persistent inert synthetic or natural materials which may float or remain in suspension in the ocean in such a manner that they may interfere materially with fishing, navigation, or other legitimate uses of the ocean.

§ 227.6 Constituents prohibited as other than trace contaminants.

(a) Subject to the exclusions of paragraphs (f), (g) and (h) of this section, the ocean dumping, or transportation for dumping, of materials containing the following constituents as other than trace contaminants will not be approved on other than an emergency basis:

(1) Organohalogen compounds;

(2) Mercury and mercury compounds;

(3) Cadmium and cadmium compounds;

(4) Oil of any kind or in any form, including but not limited to petroleum, oil sludge, oil refuse, crude oil, fuel oil, heavy diesel oil, lubricating oils, hydraulic fluids, and any mixtures containing these, transported for the purpose of dumping insofar as these are not regulated under the FWPCA;

(5) Known carcinogens, mutagens, or teratogens or materials suspected to be carcinogens, mutagens, or teratogens by responsible scientific opinion.

(b) These constituents will be considered to be present as trace contaminants only when they are present in materials otherwise acceptable for ocean dumping in such forms and amounts in liquid, suspended particulate, and solid phases that the dumping of the materials will not cause significant undesirable effects, including the possibility of danger associated with their bioaccumulation in marine organisms.

(c) The potential for significant undesirable effects due to the presence of these constituents shall be determined by application of results of bioassays on liquid, suspended particulate, and solid phases of wastes according to procedures acceptable to EPA, and for dredged material, acceptable to EPA and the Corps of Engineers. Materials shall be deemed environmentally acceptable for ocean dumping only when the following conditions are met:

(1) The liquid phase does not contain any of these constituents in concentrations which will exceed applicable marine water quality criteria after allowance for initial mixing; provided that mercury concentrations in the disposal site, after allowance for initial mixing, may exceed the average normal ambient concentrations of mercury in ocean waters at or near the dumping site which would be present in the absence of dumping, by not more than 50 percent; and

(2) Bioassay results on the suspended particulate phase of the waste do not indicate occurrence of significant mortality or significant adverse sublethal effects including bioaccumulation due to the dumping of wastes containing the constituents listed in paragraph (a) of this section. These bioassays shall be conducted with appropriate sensitive marine organisms as defined in § 227.27(c) using procedures for suspended particulate phase bioassays approved by EPA, or, for dredged material, approved by EPA and the Corps of Engineers. Procedures approved for bioassays under this section will require exposure of organisms for a sufficient period of time and under appropriate conditions to provide reasonable assurance, based on consideration of the statistical significance of effects at the 95 percent confidence level, that, when the materials are dumped, no significant undesirable effects will occur due either to chronic toxicity or to bioaccumulation of the constituents listed in paragraph (a) of this section; and

(3) Bioassay results on the solid phase of the wastes do not indicate occurrence of significant mortality or significant adverse sublethal effects due to the dumping of wastes containing the constituents listed in paragraph (a) of this section. These bioassays shall be conducted with sensitive benthic organisms using benthic bioassay procedures approved by EPA, or, for dredged material, approved by EPA and the Corps of Engineers. Procedures approved for bioassays under this section will require exposure of organisms for a sufficient period of time to provide reasonable assurance, based on considerations of statistical significance of effects at the 95 percent confidence level, that, when the materials are dumped, no significant undesirable effects will occur due either to chronic toxicity or to bioaccumulation of the constituents listed in paragraph (a) of this section; and

(4) For persistent organohalogens not included in the applicable marine water quality criteria, bioassay results on the liquid phase of the waste show that such compounds are not present in concentrations large enough to cause significant undesirable effects due either to chronic toxicity or to bioaccumulation in marine organisms after allowance for initial mixing.

(d) When the Administrator, Regional Administrator or District Engineer, as the case may be, has reasonable cause to believe that a material proposed for ocean dumping contains compounds identified as carcinogens, mutagens, or teratogens for which criteria have not been included in the applicable marine water quality criteria, he may require special studies to be done prior to issuance of a permit to determine the impact of disposal on human health and/or marine ecosystems. Such studies must provide information comparable to that required under paragraph (c)(3) of this section.

(e) The criteria stated in paragraphs (c) (2) and (3) of this section will become mandatory as soon as announcement of the availability of acceptable procedures is made in the FEDERAL REGISTER. At that time the interim criteria contained in paragraph (e) of this section shall no longer be applicable. As interim measures the criteria of paragraphs (c) (2) and (3) of this section may be applied on a case-by-case basis where interim guidance on acceptable bioassay procedures is provided by the Regional Administrator or, in the case of dredged material, by the District Engineer; or, in the absence of such guidance, permits may be issued for the dumping of any material only when the following conditions are met, except under an emergency permit:

(1) Mercury and its compounds are present in any solid phase of a material in concentrations less than 0.75 mg/kg,

or less than 50 percent greater than the average total mercury content of natural sediments of similar lithologic characteristics as those at the disposal site; and

(2) Cadmium and its compounds are present in any solid phase of a material in concentrations less than 0.6 mg/kg, or less than 50 percent greater than the average total cadmium content of natural sediments of similar lithologic characteristics as those at the disposal site; and

(3) The total concentration of organohalogen constituents in the waste as transported for dumping is less than a concentration of such constituents known to be toxic to marine organisms. In calculating the concentration of organohalogens, the applicant shall consider that these constituents are all biologically available. The determination of the toxicity value will be based on existing scientific data or developed by the use of bioassays conducted in accordance with approved EPA procedures; and

(4) The total amounts of oils and greases as identified in paragraph (a)(4) of this section do not produce a visible surface sheen in an undisturbed water sample when added at a ratio of one part waste material to 100 parts of water.

(f) The prohibitions and limitations of this section do not apply to the constituents identified in paragraph (a) of this section when the applicant can demonstrate that such constituents are (1) present in the material only as chemical compounds or forms (e.g., inert insoluble solid materials) non-toxic to marine life and non-bioaccumulative in the marine environment upon disposal and thereafter, or (2) present in the material only as chemical compounds or forms which, at the time of dumping and thereafter, will be rapidly rendered non-toxic to marine life and non-bioaccumulative in the marine environment by chemical or biological degradation in the sea; provided they will not make edible marine organisms unpalatable; or will not endanger human health or that of domestic animals, fish, shellfish, or wildlife.

(g) The prohibitions and limitations of this section do not apply to the constituents identified in paragraph (a) of this section for the granting of research permits if the substances are rapidly rendered harmless by physical, chemical or biological processes in the sea; provided they will not make edible marine organisms unpalatable and will not endanger human health or that of domestic animals.

(h) The prohibitions and limitations of this section do not apply to the constituents identified in paragraph (a) of this section for the granting of permits for the transport of these substances for the purpose of incineration at sea if the applicant can demonstrate that the stack emissions consist of substances which are rapidly rendered harmless by physical, chemical or biological processes in the sea. Incinerator operations shall comply with requirements which will be established on a case-by-case basis.

§ 227.7 Limits established for specific wastes or waste constituents.

Materials containing the following constituents must meet the additional limitations specified in this section to be deemed acceptable for ocean dumping:

(a) Liquid waste constituents immiscible with or slightly soluble in seawater, such as benzene, xylene, carbon disulfide and toluene, may be dumped only when they are present in the waste in concentrations below their solubility limits in seawater. This provision does not apply to materials which may interact with ocean water to form insoluble materials;

(b) Radioactive materials, other than those prohibited by § 227.5, must be contained in accordance with the provisions of § 227.11 to prevent their direct dispersion or dilution in ocean waters;

(c) Wastes containing living organisms may not be dumped if the organisms present would endanger human health or that of domestic animals, fish, shellfish and wildlife by:

(1) Extending the range of biological pests, viruses, pathogenic microrganisms or other agents capable of infesting, infecting or extensively and permanently altering the normal populations of organisms;

(2) Degrading uninfected areas; or

(3) Introducing viable species not indigenous to an area.

(d) In the dumping of wastes of highly acidic or alkaline nature into the ocean, consideration shall be given to: (1) the effects of any change in acidity or alkalinity of the water at the disposal site; and (2) the potential for synergistic effects or for the formation of toxic compounds at or near the disposal site. Allowance may be made in the permit conditions for the capability of ocean waters to neutralize acid or alkaline wastes; provided, however, that dumping conditions must be such that the average total alkalinity or total acidity of the ocean water after allowance for initial mixing, as defined in § 227.29, may be changed, based on stoichiometric calculations, by no more than 10 per cent during all dumping operations at a site to neutralize acid or alkaline wastes.

(e) Wastes containing biodegradable constituents, or constituents which consume oxygen in any fashion, may be dumped in the ocean only under conditions in which the dissolved oxygen after allowance for initial mixing, as defined in § 227.29, will not be depressed by more than 25 per cent below the normally anticipated ambient conditions in the disposal area at the time of dumping.

§ 227.8 Limitations on the disposal rates of toxic wastes.

No wastes will be deemed acceptable for ocean dumping unless such wastes can be dumped so as not to exceed the limiting permissible concentration as defined in § 227.27; provided that this § 227.8 does not apply to those wastes for which specific criteria are established in § 227.11 or 227.12. Total quantities of wastes dumped at a site may be limited as described in § 228.8.

§ 227.9 Limitations on quantities of waste materials.

Substances which may damage the ocean environment due to the quantities in which they are dumped, or which may seriously reduce amenities, may be dumped only when the quantities to be dumped at a single time and place are controlled to prevent long-term damage to the environment or to amenities.

§ 227.10 Hazards to fishing, navigation, shorelines or beaches.

(a) Wastes which may present a serious obstacle to fishing or navigation may be dumped only at disposal sites and under conditions which will ensure no unacceptable interference with fishing or navigation.

(b) Wastes which may present a hazard to shorelines or beaches may be dumped only at sites and under conditions which will insure no unacceptable danger to shorelines or beaches.

§ 227.11 Containerized wastes.

(a) Wastes containerized solely for transport to the dumping site and expected to rupture or leak on impact or shortly thereafter must meet the appropriate requirements of §§ 227.6, 227.7, 227.8, 227.9 and 227.10.

(b) Other containerized wastes will be approved for dumping only under the following conditions:

(1) The materials to be disposed of decay, decompose or radiodecay to environmentally innocuous materials within the life expectancy of the containers and/or their inert matrix; and

(2) Materials to be dumped are present in such quantities and are of such nature that only short-term localized adverse effects will occur should the containers rupture at any time; and

(3) Containers are dumped at depths and locations where they will cause no threat to navigation, fishing, shorelines, or beaches.

§ 227.12 Insoluble wastes.

(a) Solid wastes consisting of inert natural minerals or materials compatible with the ocean environment may be generally approved for ocean dumping provided they are insoluble above the applicable trace or limiting permissible concentrations and are rapidly and completely settleable, and they are of a particle size and density that they would be deposited or rapidly dispersed without damage to benthic, demersal, or pelagic biota.

(b) Persistent inert synthetic or natural materials which may float or remain in suspension in the ocean as prohibited in paragraph (d) of § 227.5 may be dumped in the ocean only when they have been processed in such a fashion that they will sink to the bottom and remain in place.

§ 227.13 Dredged materials.

(a) Dredged materials are bottom sediments or materials that have been dredged or excavated from the navigable waters of the United States, and their disposal into ocean waters is regulated by the U.S. Army Corps of Engineers using the criteria of applicable sections of Parts 227 and 228. Dredged material consists primarily of natural sediments or materials which may be contaminated by municipal or industrial wastes or by runoff from terrestrial sources such as agricultural lands.

(b) Dredged material which meets the criteria set forth in the following paragraphs (1), (2), or (3) is environmentally acceptable for ocean dumping without further testing under this section:

(1) Dredged material is composed predominantly of sand, gravel, rock, or any other naturally occurring bottom material with particle sizes larger than silt, and the material is found in areas of high current or wave energy such as streams with large bed loads or coastal areas with shifting bars and channels; or

(2) Dredged material is for beach nourishment or restoration and is composed predominantly of sand, gravel or shell with particle sizes compatible with material on the receiving beaches; or

(3) When: (i) The material proposed for dumping is substantially the same as the substrate at the proposed disposal site; and

(ii) The site from which the material proposed for dumping is to be taken is far removed from known existing and historical sources of pollution so as to provide reasonable assurance that such material has not been contaminated by such pollution.

(c) When dredged material proposed for ocean dumping does not meet the criteria of paragraph (b) of this section, further testing of the liquid, suspended particulate, and solid phases, as defined in § 227.32, is required. Based on the results of such testing, dredged material can be considered to be environmentally acceptable for ocean dumping only under the following conditions:

(1) The material is in compliance with the requirements of § 227.6; and

(2) (i) All major constituents of the liquid phase are in compliance with the applicable marine water quality criteria after allowance for initial mixing; or

(ii) When the liquid phase contains major constituents not included in the applicable marine water quality criteria, or there is reason to suspect synergistic effects of certain contaminants, bioassays on the liquid phase of the dredged material show that it can be discharged so as not to exceed the limiting permissible concentration as defined in paragraph (a) of § 227.27; and

(3) Bioassays on the suspended particulate and solid phases show that it can be discharged so as not to exceed the limiting permissible concentration as defined in paragraph (b) of § 227.27.

(d) For the purposes of paragraph (c) (2), major constituents to be analyzed in the liquid phase are those deemed critical by the District Engineer, after evaluating and considering any comments received from the Regional Administrator, and considering known sources of discharges in the area.

Subpart C—Need for Ocean Dumping

§ 227.14 Criteria for evaluating the need for ocean dumping and alternatives to ocean dumping.

This Subpart C states the basis on which an evaluation will be made of the need for ocean dumping, and alternatives to ocean dumping. The nature of these factors does not permit the promulgation of specific quantitative criteria of each permit application. These factors will therefore be evaluated if applicable for each proposed dumping on an individual basis using the guidelines specified in this Subpart C.

§ 227.15 Factors considered.

The need for dumping will be determined by evaluation of the following factors:

(a) Degree of treatment useful and feasible for the waste to be dumped, and whether or not the waste material has been or will be treated to this degree before dumping;

(b) Raw materials and manufacturing or other processes resulting in the waste, and whether or not these materials or processes are essential to the provision of the applicant's goods or services, or if other less polluting materials or processes could be used;

(c) The relative environmental risks, impact and cost for ocean dumping as opposed to other feasible alternatives including but not limited to:

(1) Land fill;

(2) Well injection;

(3) Incineration;

(4) Spread of material over open ground;

(5) Recycling of material for reuse;

(6) Additional biological, chemical, or physical treatment of intermediate or final waste streams;

(7) Storage.

(d) Irreversible or irretrievable consequences of the use of alternatives to ocean dumping.

§ 227.16 Basis for determination of need for ocean dumping.

(a) A need for ocean dumping will be considered to have been demonstrated when a thorough evaluation of the factors listed in § 227.15 has been made, and the Administrator, Regional Administrator or District Engineer, as the case may be, has determined that the following conditions exist where applicable:

(1) There are no practicable improvements which can be made in process technology or in overall waste treatment to reduce the adverse impacts of the waste on the total environment;

(2) There are no practicable alternative locations and methods of disposal or recycling available, including without limitation, storage until treatment facilities are completed, which have less adverse environmental impact or potential risk to other parts of the environment than ocean dumping.

(b) For purposes of paragraph (a) of this section, waste treatment or improvements in processes and alternative methods of disposal are practicable when they are available at reasonable incremental cost and energy expenditures, which need not be competitive with the costs of ocean dumping, taking into account the environmental benefits derived from such activity, including the relative adverse environmental impacts associated with the use of alternatives to ocean dumping.

(c) The duration of permits issued under Subchapter H and other terms and conditions imposed in those permits shall be determined after taking into account the factors set forth in this section. Notwithstanding compliance with Subparts B, D, and E of this Part 227 permittees may, on the basis of the need for and alternatives to ocean dumping, be required to terminate all ocean dumping by a specified date, to phase out all ocean dumping over a specified period or periods, to continue research and development of alternative methods of disposal and make periodic reports of such research and development in order to provide additional information for periodic review of the need for and alternatives to ocean dumping, or to take such other action as the Administrator, the Regional Administrator, or District Engineer, as the case may be, determines to be necessary or appropriate.

Subpart D—Impact of the Proposed Dumping on Esthetic, Recreational and Economic Values

§ 227.17 Basis for determination.

(a) The impact of dumping on esthetic, recreational and economic values will be evaluated on an individual basis using the following considerations:

(1) potential for affecting recreational use and values of ocean waters, inshore waters, beaches, or shorelines;

(2) potential for affecting the recreational and commercial values of living marine resources.

(b) For all proposed dumping, full consideration will be given to such nonquantifiable aspects of esthetic, recreational and economic impact as:

(1) responsible public concern for the consequences of the proposed dumping;

(2) consequences of not authorizing the dumping including without limitation, the impact on esthetic, recreational and economic values with respect to the municipalities and industries involved.

§ 227.18 Factors considered.

The assessment of the potential for impacts on esthetic, recreational and economic values will be based on an evaluation of the appropriate characteristics of the material to be dumped, allowing for conservative rates of dilution, dispersion, and biochemical degradation during movement of the materials from a disposal site to an area of significant recreational or commercial value. The following specific factors will be considered in making such an assessment:

(a) Nature and extent of present and potential recreational and commercial use of areas which might be affected by the proposed dumping;

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(b) Existing water quality, and nature and extent of disposal activities, in the areas which might be affected by the proposed dumping;

(c) Applicable water quality standards;

(d) Visible characteristics of the materials (e.g., color, suspended particulates) which result in an unacceptable esthetic nuisance in recreational areas;

(e) Presence in the material of pathogenic organisms which may cause a public health hazard either directly or through contamination of fisheries or shellfisheries;

(f) Presence in the material of toxic chemical constituents released in volumes which may affect humans directly;

(g) Presence in the material of chemical constituents which may be bioaccumulated or persistent and may have an adverse effect on humans directly or through food chain interactions;

(h) Presence in the material of any constituents which might significantly affect living marine resources of recreational or commercial value.

§ 227.19 Assessment of impact.

An overall assessment of the proposed dumping and possible alternative methods of disposal or recycling will be made based on the effect on esthetic, recreational and economic values based on the factors set forth in this Subpart D, including where applicable, enhancement of these values, and the results of the assessment will be expressed, where possible, on a quantitative basis, such as percentage of a resource lost, reduction in user days of recreational areas, or dollars lost in commercial fishery profits or the profitability of other commercial enterprises.

Subpart E—Impact of the Proposed Dumping on Other Uses of the Ocean

§ 227.20 Basis for determination.

(a) Based on current state-of-the-art, consideration must be given to any possible long-range effects of even the most innocuous substances when dumped in the ocean on a continuing basis. Such a consideration is made in evaluating the relationship of each proposed disposal activity in relationship to its potential for long-range impact on other uses of the ocean.

(b) An evaluation will be made on an individual basis for each proposed dumping of material of the potential for effects on uses of the ocean for purposes other than material disposal. The factors to be considered in this evaluation include those stated in Subpart D, but the evaluation of this Subpart E will be based on the impact of the proposed dumping on specific uses of the ocean rather than on overall esthetic, recreational and economic values.

§ 227.21 Uses considered.

An appraisal will be made of the nature and extent of existing and potential uses of the disposal site itself and of any areas which might reasonably be expected to be affected by the proposed dumping, and a quantitative and qualitative evaluation made, where feasible, of the impact of the proposed dumping on each use. The uses considered shall include, but not be limited to:

(a) Commercial fishing in open ocean areas;

(b) Commercial fishing in coastal areas;

(c) Commercial fishing in estuarine areas;

(d) Recreational fishing in open ocean areas;

(e) Recreational fishing in coastal areas;

(f) Recreational fishing in estuarine areas;

(g) Recreational use of shorelines and beaches;

(h) Commercial navigation;

(i) Recreational navigation;

(j) Actual or anticipated exploitation of living marine resources;

(k) Actual or anticipated exploitation of non-living resources, including without limitation, sand and gravel places and other mineral deposits, oil and gas exploration and development and offshore marine terminal or other structure development; and

(l) Scientific research and study.

§ 227.22 Assessment of impact.

The assessment of impact on other uses of the ocean will consider both temporary and long-range effects within the state of the art, but particular emphasis will be placed on any irreversible or irretrievable commitment of resources that would result from the proposed dumping.

Subpart F—Special Requirements for Interim Permits Under Section 102 of the Act

§ 227.23 General requirement.

Each interim permit issued under section 102 of the Act will include a requirement for the development and implementation, as soon as practicable, of a plan which requires, at the discretion of the Administrator or Regional Administrator, as the case may be, either:

(a) Elimination of ocean disposal of the waste, or

(b) Bringing the waste into compliance with all the criteria for acceptable ocean disposal.

§ 227.24 Contents of environmental assessment.

A plan developed pursuant to this Subpart F must include an environmental assessment of the proposed action, including without limitation:

(a) Description of the proposed action;

(b) A thorough review of the actual need for dumping;

(c) Environmental impact of the proposed action;

(d) Adverse impacts which cannot be avoided should the proposal be implemented;

(e) Alternatives to the proposed action;

(f) Relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity;

(g) Irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented; and

(h) A discussion of problems and objections raised by other Federal, State and local agencies and by interested persons in the review process.

§ 227.25 Contents of plans.

In addition to the environmental assessment required by § 227.24, a plan developed pursuant to this Subpart F must include a schedule for eliminating ocean dumping or bringing the wastes into compliance with the environmental impact criteria of Subpart B, including without limitation, the following:

(a) If the waste is treated to the degree necessary to bring it into compliance with the ocean dumping criteria, the applicant should provide a description of the treatment and a scheduled program for treatment and a subsequent analysis of treated material to prove the effectiveness of the process.

(b) If treatment cannot be effected by post-process techniques the applicant should, determining the offending constituents, examine his raw materials and his total process to determine the origin of the pollutant. If the offending constituents are found in the raw material the applicant should consider a new supplier and provide an analysis of the new material to prove compliance. Raw materials are to include all water used in the process. Water from municipal sources complying with drinking water standards is acceptable. Water from other sources such as private wells should be analyzed for contaminants. Water that has been used in the process should be considered for treatment and recycling as an additional source of process water.

(c) If offending constituents are a result of the process, the applicant should investigate and describe the source of the constituents. A report of this information will be submitted to EPA and the applicant will then submit a proposal describing possible alternatives to the existing process or processes and level of cost and effectiveness.

(d) If an acceptable alternative to ocean dumping or additional control technology is required, a schedule and documentation for implementation of the alternative or approved control process shall be submitted and shall include, without limitation:

(1) Engineering plan;
(2) Financing approval;
(3) Starting date for change;
(4) Completion date;
(5) Operation starting date.

(e) If an acceptable alternative does not exist at the time the application is submitted, the applicant will submit an acceptable in-house research program or employ a competent research institution to study the problem. The program of research must be approved by the Administrator or Regional Administrator, as the case may be, before the initiation of the research. The schedule and documentation for implementation of a research program will include, without limitation:

(1) Approaches;
(2) Experimental design;
(3) Starting date;
(4) Reporting intervals;
(5) Proposed completion date;
(6) Date for submission of final report.

§ 227.26 Implementation of plans.

Implementation of each phase of a plan shall be initiated as soon as it is approved by the Administrator or Regional Administrator, as the case may be.

Subpart G—Definitions

§ 227.27 Limiting permissible concentration (LPC).

(a) The limiting permissible concentration of the liquid phase of a material is:

(1) That concentration of a constituent which, after allowance for initial mixing as provided in § 227.29, does not exceed applicable marine water quality criteria; or, when there are no applicable marine water quality criteria,

(2) That concentration of waste or dredged material in the receiving water which, after allowance for initial mixing, as specified in § 227.29, will not exceed a toxicity threshold defined as 0.01 of a concentration shown to be acutely toxic to appropriate sensitive marine organisms in a bioassay carried out in accordance with approved EPA procedures.

(3) When there is reasonable scientific evidence on a specific waste material to justify the use of an application factor other than 0.01 as specified in paragraph (a)(2) of this section, such alternative application factor shall be used in calculating the LPC.

(b) The limiting permissible concentration of the suspended particulate and solid phases of a material means that concentration which will not cause unreasonable acute or chronic toxicity or other sublethal adverse effects based on bioassay results using appropriate sensitive marine organisms in the case of the suspended particulate phase, or appropriate sensitive benthic marine organisms in the case of the solid phase; or which will not cause accumulation of toxic materials in the human food chain. These bioassays are to be conducted in accordance with procedures approved by EPA, or, in the case of dredged material, approved by EPA and the Corps of Engineers.[1]

(c) "Appropriate sensitive marine organisms" means at least one species each representative of phytoplankton or zooplankton, crustacean or mollusk, and fish species chosen from among the most sensitive species documented in the scientific literature or accepted by EPA as being reliable test organisms to determine the anticipated impact of the wastes on the ecosystem at the disposal site. Bioassays, except on phytoplankton or zooplankton, shall be run for a minimum of 96 hours under temperature, salinity, and dissolved oxygen conditions representing the extremes of environmental stress at the disposal site. Bioassays on phytoplankton or zooplankton may be run for shorter periods of time as appropriate for the organisms tested at the discretion of EPA, or EPA and the Corps of Engineers, as the case may be.

(d) "Appropriate sensitive benthic marine organisms" means at least one species each representing filter-feeding, deposit-feeding, and burrowing species chosen from among the most sensitive species accepted by EPA as being reliable test organisms to determine the anticipated impact on the site; provided, however, that until sufficient species are adequately tested and documented, interim guidance on appropriate organisms available for use will be provided by the Administrator, Regional Administrator, or the District Engineer, as the case may be.

§ 227.28 Release zone.

The release zone is the area swept out by the locus of points constantly 100 meters from the perimeter of the conveyance engaged in dumping activities, beginning at the first moment in which dumping is scheduled to occur and ending at the last moment in which dumping is scheduled to occur. No release zone shall exceed the total surface area of the dumpsite.

§ 227.29 Initial mixing.

(a) Initial mixing is defined to be that dispersion or diffusion of liquid, suspended particulate, and solid phases of a waste which occurs within four hours after dumping. The limiting permissible concentration shall not be exceeded beyond the boundaries of the disposal site during initial mixing, and shall not be exceeded at any point in the marine environment after initial mixing. The maximum concentration of the liquid, suspended particulate, and solid phases of a dumped material after initial mixing shall be estimated by one of these methods, in order of preference:

(1) When field data on the proposed dumping are adequate to predict initial dispersion and diffusion of the waste, these shall be used, if necessary, in conjunction with an appropriate mathematical model acceptable to EPA or the District Engineer, as appropriate.

(2) When field data on the dispersion and diffusion of a waste of characteristics similar to that proposed for discharge are available, these shall be used in conjunction with an appropriate mathematical model acceptable to EPA or the District Engineer, as appropriate.

(3) When no field data are available, theoretical oceanic turbulent diffusion relationships may be applied to known characteristics of the waste and the disposal site.

(b) When no other means of estimation are feasible,

(1) The liquid and suspended particulate phases of the dumped waste may be assumed to be evenly distributed after four hours over a column of water bounded on the surface by the release zone and extending to the ocean floor, thermocline, or halocline if one exists, or to a depth of 20 meters, whichever is shallower, and

(2) The solid phase of a dumped waste may be assumed to settle rapidly to the ocean bottom and to be distributed evenly over the ocean bottom in an area equal to that of the release zone as defined in § 227.28.

(c) When there is reasonable scientific evidence to demonstrate that other methods of estimating a reasonable allowance for initial mixing are appropriate for a specific material, such methods may be used with the concurrence of EPA after appropriate scientific review.

§ 227.30 High-level radioactive waste.

High-level radioactive waste means the aqueous waste resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated waste from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuels or irradiated fuel from nuclear power reactors.

§ 227.31 Applicable marine water quality criteria.

Applicable marine water quality criteria means the criteria given for marine waters in the EPA publication "Quality Criteria for Water" as published in 1976 and amended by subsequent supplements or additions.

§ 227.32 Liquid, suspended particulate, and solid phases of a material.

(a) For the purposes of these regulations, the liquid phase of a material, subject to the exclusions of paragraph (b) of this section, is the supernatant remaining after one hour undisturbed settling, after centrifugation and filtration through a 0.45 micron filter. The suspended particulate phase is the supernatant as obtained above prior to centrifugation and filtration. The solid phase includes all material settling to the bottom in one hour. Settling shall be conducted according to procedures approved by EPA.

(b) For dredged material, other material containing large proportions of insoluble matter, materials which may interact with ocean water to form insoluble matter or new toxic compounds, or materials which may release toxic compounds upon deposition, the Administrator, Regional Administrator, or the District Engineer, as the case may be, may require that the separation of liquid, suspended particulate, and solid phases of the material be performed upon a mixture of the waste with ocean water rather than on the material itself. In such cases the following procedures shall be used:

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[1] An implementation manual is being developed jointly by EPA and the Corps of Engineers, and announcement of the availability of the manual will be published in the FEDERAL REGISTER. Until this manual is available, interim guidance on the appropriate procedures can be obtained from the Marine Protection Branch, WH-548, Environmental Protection Agency, 401 M Street SW, Washington, DC 20460, or the Corps of Engineers, as the case may be.

(1) For dredged material, the liquid phase is considered to be the centrifuged and 0.45 micron filtered supernatant remaining after one hour undisturbed settling of the mixture resulting from a vigorous 30-minute agitation of one part bottom sediment from the dredging site with four parts water (vol/vol) collected from the dredging site or from the disposal site, as appropriate for the type of dredging operation. The suspended particulate phase is the supernatant as obtained above prior to centrifugation and filtration. The solid phase is considered to be all material settling to the bottom within one hour. Settling shall be conducted by procedures approved by EPA and the Corps of Engineers.

(2) For other materials, the proportion of ocean water used shall be the minimum amount necessary to produce the anticipated effect (e.g., complete neutralization of an acid or alkaline waste) based on guidance provided by EPA on particular cases, or in accordance with approved EPA procedures. For such materials the liquid phase is the filtered and centrifuged supernatant resulting from the mixture after 30 minutes of vigorous shaking followed by undisturbed settling for one hour. The suspended particulate phase is the supernatant as obtained above prior to centrifugation and filtration. The solid phase is the insoluble material settling to the bottom in that period.

PART 228—CRITERIA FOR THE MANAGEMENT OF DISPOSAL SITES FOR OCEAN DUMPING

Sec.

228.1 Applicability.
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228.12 Delegation of management authority for interim ocean dumping sites.
228.13 Guidelines for ocean disposal site baseline or trend assessment surveys under Section 102 of the Act.

AUTHORITY: 33 U.S.C. 1412 and 1418.

§ 228.1 Applicability.

The criteria of this Part 228 are established pursuant to section 102 of the Act and apply to the evaluation of proposed ocean dumping under Title I of the Act. The criteria of this Part 228 deal with the evaluation of the proposed dumping of material in ocean waters in relation to continuing requirements for effective management of ocean disposal sites to prevent unreasonable degradation of the marine environment from all wastes being dumped in the ocean. This Part 228 is applicable to dredged material disposal sites only as specified in §§ 228.4(e), 228.9, and 228.12.

§ 228.2 Definitions.

(a) The term "disposal site" means an interim or finally approved and precise geographical area within which ocean dumping of wastes, is permitted under conditions specified in permits issued under sections 102 and 103 of the Act. Such sites are identified by boundaries established by (1) coordinates of latitude and longitude for each corner, or by (2) coordinates of latitude and longitude for the center point and a radius in nautical miles from that point. Boundary coordinates shall be identified as precisely as is warranted by the accuracy with which the site can be located with existing navigational aids or by the implantation of transponders, buoys or other means of marking the site.

(b) The term "baseline" or "trend assessment" survey means the planned sampling or measurement of parameters at set stations or in set areas in and near disposal sites for a period of time sufficient to provide synoptic data for determining water quality, benthic, or biological conditions as a result of ocean disposal operations. The minimum requirements for such surveys are given in § 228.13.

(c) The term "disposal site evaluation study" means the collection, analysis, and interpretation of all pertinent information available concerning an existing disposal site, including but not limited to, data and information from trend assessment surveys, monitoring surveys, special purpose surveys of other Federal agencies, public data archives, and social and economic studies and records of affected areas.

(d) The term "disposal site designation study" means the collection, analysis and interpretation of all available pertinent data and information on a proposed disposal site prior to use, including but not limited to, that from baseline surveys, special purpose surveys of other Federal agencies, public data archives, and social and economic studies and records of areas which would be affected by use of the proposed site.

(e) The term "management authority" means the EPA organizational entity assigned responsibility for implementing the management functions identified in § 228.3.

(f) "Statistical significance" shall mean the statistical significance determined by using appropriate standard techniques of multivariate analysis with results interpreted at the 95 percent confidence level and based on data relating species which are present in sufficient numbers at control areas to permit a valid statistical comparison with the areas being tested.

(g) "Valuable commercial and recreational species" shall mean those species for which catch statistics are compiled on a routine basis by the Federal or State agency responsible for compiling such statistics for the general geographical area impacted, or which are under current study by such Federal or State agencies for potential development for commercial or recreational use.

(h) "Normal ambient value" means that concentration of a chemical species reasonably anticipated to be present in the water column, sediments, or biota in the absence of disposal activities at the disposal site in question.

§ 228.3 Disposal site management responsibilities.

Management of a site consists of regulating times, rates, and methods of disposal and quantities and types of materials disposed of; developing and maintaining effective ambient monitoring programs for the site; conducting disposal site evaluation and designation studies; and recommending modifications in site use and/or designation (e.g., termination of use of the site for general use or for disposal of specific wastes).

Each site, upon interim or continuing use designation, will be assigned to either an EPA Regional office or to EPA Headquarters for management. These designations will be consistent with the delegation of authority in § 220.4. The designated management authority is fully responsible for all aspects of the management of sites within the general requirements specified in § 220.4 and this section. Specific requirements for meeting the management responsibilities assigned to the designated management authority for each site are outlined in §§ 228.5 and 228.6.

§ 228.4 Procedures for designation of sites.

(a) *General Permits.* Geographical areas or regions within which materials may be dumped under a general permit will be published as part of the promulgation of each general permit.

(b) *Special and Interim Permits.* Areas where ocean dumping is permitted subject to the specific conditions of individual special or interim permits, will be designated by promulgation in this Part 228, and such designation will be made based on environmental studies of each site, regions adjacent to the site, and on historical knowledge of the impact of waste disposal on areas similar to such sites in physical, chemical, and biological characteristics. All studies for the evaluation and potential selection of dumping sites will be conducted in accordance with the requirements of §§ 228.5 and 228.6.

The Administrator may, from time to time, designate specific locations for temporary use for disposal of small amounts of materials under a special permit only without disposal site designation studies when such materials satisfy the Criteria and the Administrator determines that the quantities to be disposed of at such sites will not result in significant impact on the environment. Such designations will be done by promulgation in this Part 228, and will be for a specified period of time and for specified quantities of materials.

(c) *Emergency Permits.* Dumping sites for materials disposed of under an emergency permit will be specified by the Administrator as a permit condition and will be based on an individual appraisal

of the characteristics of the waste and the safest means for its disposal.

(d) *Research Permits.* Dumping sites for research permits will be determined by the nature of the proposed study. Dumping sites will be specified by the Administrator as a permit condition.

(e) *Dredged Material Permits.*

(1) Areas where ocean dumping of dredged material is permitted subject to the specific conditions of Dredged Material permits issued by the U.S. Army Corps of Engineers will be designated by EPA by promulgation in this Part 228, and such designation will be made based on environmental studies of each site, regions adjacent to the site, and on historical knowledge of the impact of dredged material disposal on areas similar to such sites in physical, chemical, and biological characteristics. All studies for the evaluation and potential selection of dredged material disposal sites will be conducted in accordance with the appropriate requirements of §§ 228.5 and 228.6, except that:

(i) Baseline or trend assessment requirements may be developed on a case-by-case basis from the results of research, including that now in progress by the Corps of Engineers.

(ii) An environmental impact assessment for all sites within a particular geographic area may be prepared based on complete disposal site designation or evaluation studies on a typical site or sites in that area. In such cases, sufficient studies to demonstrate the generic similarity of all sites within such a geographic area will be conducted.

(2) In those cases where a recommended disposal site has not been designated by the Administrator, or where it is not feasible to utilize a recommended disposal site that has been designated by the Administrator, the District Engineer shall, in consultation with EPA, select a site in accordance with the requirements of §§ 228.5 and 228.6(a). Concurrence by EPA in permits issued for the use of such site for the dumping of dredged material at the site will constitute EPA approval of the use of the site for dredged material disposal only.

(3) Sites designated for the ocean dumping of dredged material in accordance with the procedures of paragraphs (e)(1) or (e)(2) of this section shall be used only for the ocean dumping of dredged material under permits issued by the U.S. Army Corps of Engineers.

§ 228.5 General criteria for the selection of sites.

(a) The dumping of materials into the ocean will be permitted only at sites or in areas selected to minimize the interference of disposal activities with other activities in the marine environment, particularly avoiding areas of existing fisheries or shellfisheries, and regions of heavy commercial or recreational navigation.

(b) Locations and boundaries of disposal sites will be so chosen that temporary perturbations in water quality or other environmental conditions during initial mixing caused by disposal operations anywhere within the site can be expected to be reduced to normal ambient seawater levels or to undetectable contaminant concentrations or effects before reaching any beach, shoreline, marine sanctuary, or known geographically limited fishery or shellfishery.

(c) If at anytime during or after disposal site evaluation studies, it is determined that existing disposal sites presently approved on an interim basis for ocean dumping do not meet the criteria for site selection set forth in §§ 228.5–228.6, the use of such sites will be terminated as soon as suitable alternate disposal sites can be designated.

(d) The sizes of ocean disposal sites will be limited in order to localize for identification and control any immediate adverse impacts and permit the implementation of effective monitoring and surveillance programs to prevent adverse long-range impacts. The size, configuration, and location of any disposal site will be determined as a part of the disposal site evaluation or designation study.

(e) EPA will, wherever feasible, designate ocean dumping sites beyond the edge of the continental shelf and other such sites that have been historically used.

§ 228.6 Specific criteria for site selection.

(a) In the selection of disposal sites, in addition to other necessary or appropriate factors determined by the Administrator, the following factors will be considered:

(1) Geographical position, depth of water, bottom topography and distance from coast;

(2) Location in relation to breeding, spawning, nursery, feeding, or passage areas of living resources in adult or juvenile phases;

(3) Location in relation to beaches and other amenity areas;

(4) Types and quantities of wastes proposed to be disposed of, and proposed methods of release, including methods of packing the waste, if any;

(5) Feasibility of surveillance and monitoring;

(6) Dispersal, horizontal transport and vertical mixing characteristics of the area, including prevailing current direction and velocity, if any;

(7) Existence and effects of current and previous discharges and dumping in the area (including cumulative effects);

(8) Interference with shipping, fishing, recreation, mineral extraction, desalination, fish and shellfish culture, areas of special scientific importance and other legitimate uses of the ocean;

(9) The existing water quality and ecology of the site as determined by available data or by trend assessment or baseline surveys;

(10) Potentiality for the development or recruitment of nuisance species in the disposal site;

(11) Existence at or in close proximity to the site of any significant natural or cultural features of historical importance.

(b) The results of a disposal site evaluation and/or designation study based on the criteria stated in paragraphs (1)–(11) will be presented in support of the site designation promulgation as an environmental assessment of the impact of the use of the site for disposal, and will be used in the preparation of an environmental impact statement for each site where such a statement is required by EPA policy. By publication of a notice in accordance with this Part 228, an environmental impact statement, in draft form, will be made available for public comment not later than the time of publication of the site designation as proposed rulemaking, and a final EIS will be made available at the time of final rulemaking.

§ 228.7 Regulation of disposal site use.

Where necessary, disposal site use will be regulated by setting limitations on times of dumping and rates of discharge, and establishing a disposal site monitoring program.

§ 228.8 Limitations on times and rates of disposal.

Limitations as to time for and rates of dumping may be stated as part of the promulgation of site designation. The times and the quantities of permitted material disposal will be regulated by the EPA management authority so that the limits for the site as specified in the site designation are not exceeded. This will be accomplished by the denial of permits for the disposal of some materials, by the imposition of appropriate conditions on other permits and, if necessary, the designation of new disposal sites under the procedures of § 228.4. In no case may the total volume of material disposed of at any site under special or interim permits cause the concentration of the total materials or any constituent of any of the materials being disposed of at the site to exceed limits specified in the site designation.

§ 228.9 Disposal site monitoring.

(a) The monitoring program, if deemed necessary by the Regional Administrator or the District Engineer, as appropriate, may include baseline or trend assessment surveys by EPA, NOAA, other Federal agencies, or contractors, special studies by permittees, and the analysis and interpretation of data from remote or automatic sampling and/or sensing devices. The primary purpose of the monitoring program is to evaluate the impact of disposal on the marine environment by referencing the monitoring results to a set of baseline conditions. When disposal sites are being used on a continuing basis, such programs may consist of the following components:

(i) Trend assessment surveys conducted at intervals frequent enough to assess the extent and trends of environmental impact. Until survey data or other information are adequate to show that changes in frequency or scope are necessary or desirable, trend assessment and baseline surveys should generally conform to the applicable requirements of § 228.13. These surveys shall be the responsibility of the Federal government.

(2) Special studies conducted by the permittee to identify immediate and short-term impacts of disposal operations.

(b) These surveys may be supplemented, where feasible and useful, by data collected from the use of automatic sampling buoys, satellites or in situ platforms, and from experimental programs.

(c) EPA will require the full participation of permittees, and encourage the full participation of other Federal and State and local agencies in the development and implementation of disposal site monitoring programs. The monitoring and research programs presently supported by permittees may be incorporated into the overall monitoring program insofar as feasible.

§ 228.10 Evaluating disposal impact.

(a) Impact of the disposal at each site designated under section 102 of the Act will be evaluated periodically and a report will be submitted as appropriate as part of the Annual Report to Congress. Such reports will be prepared by or under the direction of the EPA management authority for a specific site and will be based on an evaluation of all data available from baseline and trend assessment surveys, monitoring surveys, and other data pertinent to conditions at and near a site.

(b) The following types of effects, in addition to other necessary or appropriate considerations, will be considered in determining to what extent the marine environment has been impacted by materials disposed of at an ocean disposal site:

(1) Movement of materials into estuaries or marine sanctuaries, or onto oceanfront beaches, or shorelines;

(2) Movement of materials toward productive fishery or shellfishery areas;

(3) Absence from the disposal site of pollution-sensitive biota characteristic of the general area;

(4) Progressive, non-seasonal, changes in water quality or sediment composition at the disposal site, when these changes are attributable to materials disposed of at the site;

(5) Progressive, non-seasonal, changes in composition or numbers of pelagic, demersal, or benthic biota at or near the disposal site, when these changes can be attributed to the effects of materials disposed of at the site;

(6) Accumulation of material constituents (including without limitation, human pathogens) in marine biota at or near the site.

(c) The determination of the overall severity of disposal at the site on the marine environment, including without limitation, the disposal site and adjacent areas, will be based on the evaluation of the entire body of pertinent data using appropriate methods of data analysis for the quantity and type of data available. Impacts will be categorized according to the overall condition of the environment of the disposal site and adjacent areas based on the determination by the EPA management authority assessing the nature and extent of the effects identified in paragraph (b) of this section in addition to other necessary or appropriate considerations. The following categories shall be used:

(1) *Impact Category I:* The effects of activities at the disposal site shall be categorized in Impact Category I when one or more of the following conditions is present and can reasonably be attributed to ocean dumping activities:

(i) There is identifiable progressive movement or accumulation, in detectable concentrations above normal ambient values, of any waste or waste constituent from the disposal site within 12 nautical miles of any shoreline, marine sanctuary designated under Title III of the Act, or critical area designated under section 102(c) of the Act; or

(ii) The biota, sediments, or water column of the disposal site, or of any area outside the disposal site where any waste or waste constituent from the disposal site is present in detectable concentrations above normal ambient values, are adversely affected by the toxicity of such waste or waste constituent to the extent that there are statistically significant decreases in the populations of valuable commercial or recreational species, or of specific species of biota essential to the propagation of such species, within the disposal site and such other area as compared to populations of the same organisms in comparable locations outside such site and area; or

(iii) Solid waste material disposed of at the site has accumulated at the site or in areas adjacent to it, to such an extent that major uses of the site or of adjacent areas are significantly impaired and the Federal or State agency responsible for regulating such uses certifies that such significant impairment has occurred and states in its certificate the basis for its determination of such impairment; or

(iv) There are adverse effects on the taste or odor of valuable commercial or recreational species as a result of disposal activities; or

(v) When any toxic waste, toxic waste constituent, or toxic byproduct of waste interaction, is consistently identified in toxic concentrations above normal ambient values outside the disposal site more than four hours after disposal.

(2) *Impact Category II:* The effects of activities at the disposal site which are not categorized in Impact Category I shall be categorized in Impact Category II.

§ 228.11 Modification in disposal site use.

(a) Modifications in disposal site use which involve the withdrawal of designated disposal sites from use or permanent changes in the total specified quantities or types of wastes permitted to be discharged to a specific disposal site will be made through promulgation of an amendment to the disposal site designation set forth in this Part 228 and will be based on the results of the analyses of impact described in § 228.10 or upon changed circumstances concerning use of the site.

(b) Modifications in disposal site use promulgated pursuant to paragraph (a) of this section shall not automatically modify conditions of any outstanding permit issued pursuant to this Subchapter H, and provided further that unless the EPA management authority for such site modifies, revokes or suspends such permit or any of the terms or conditions of such permit in accordance with the provisions of § 228.2 based on the results of impact analyses as described in § 228.10 or upon changed circumstances concerning use of the site, such permit will remain in force until its expiration date.

(c) When the EPA management authority determines that activities at a disposal site have placed the site in Impact Category I, the Administrator or the Regional Administrator, as the case may be, shall place such limitations on the use of the site as are necessary to reduce the impacts to acceptable levels.

(d) The determination of the Administrator as to whether to terminate or limit use of a disposal site will be based on the impact of disposal at the site itself and on the Criteria.

§ 228.12 Delegation of management authority for interim ocean dumping sites.

(a) The following sites are approved for dumping the indicated materials on an interim basis pending completion of baseline or trend assessment surveys and designation for continuing use or termination of use. Management authority for all sites is delegated to the EPA organizational entity under which each site is listed. The sizes and use specifications are based on historical usage and do not necessarily meet the criteria stated in this Part. This list of interim sites will remain in force for a period not to exceed three years from the date of final promulgation of this Part 228, except for those sites approved for continuing use or disapproved for use by promulgation in this Part during that period of time.

Approved interim dumping sites

Location (latitude, longitude)	EPA region	Primary use
43°33'00" N., 69°55'00" W., 1 nautical mile radius	I	Industrial wastes.
42°25'42" N., 70°35'00" W., 1 nautical mile radius	I	Do.
40°22'30" N. to 40°25'00" N., 73°41'30" W. to 73°45'00" W	II	Municipal sewage sludge.
40°16'00" N. to 40°20'00" N., 73°36'00" W. to 73°40'00" W	II	Acid wastes.
38°40'00" N. to 39°00'00" N., 72°00'00" W. to 72°30'00" W	II	Industrial wastes.
40°23'00" N., 73°49'00" W., 0.6 nautical mile radius	II	Cellar dirt.
40°10'00" N., 73°42'00" W., 0.5 nautical mile radius	II	Wrecks.
19°10'00" N. to 19°20'00" N., 66°35'00" W. to 66°50'00" W	II	Industrial wastes.
38°30'00" N. to 38°35'00" N., 74°15'00" W. to 74°25'00" W	III	Acid wastes.
38°20'00" N. to 38°25'00" N., 74°10'00" W. to 74°20'00" W	III	Municipal sewage sludge.
31°49'00" N., 80°30'00" W., 31°47'00" N., 80°29'00" W., 31°48'00" N., 80°30'30" W., 31°46'20" N., 80°32'00" W.	IV	Industrial wastes.
27°12'00" N. to 27°28'00" N., 94°28'00" W. to 94°44'00" W	VI	Do.
28°00'00" N. to 28°10'00" N., 89°15'00" W. to 89°30'00" W	VI	Do.

DREDGED MATERIAL SITES

(All dredged material sites will be retained under EPA Headquarters management until formally approved for continuing use or otherwise assigned for Regional management prior to such designation.)

LOCATION (LAT., LONG.)

Marblehead, MA—42°25'42" N., 70°34'00" W. (2 N. Mi. diameter).

Boston, MA—41°49'00" N., 70°25'00" W. (1 N. Mi. diameter).

Portland, ME—43°32'18" N., 70°06'06" W. (1 Mi. diameter).

Cape Arundel, ME—43°17'45" N., 70°27'12" W. (500 yds. diameter).

Absecon Inlet—39°21'07" N., 74°23'40" W.; 39°21'18" N., 74°23'53" W.

Cold Spring Inlet—38°55'41" N., 74°53'05" W.; 38°55'33" N., 74°53'23" W.

Manasquan Inlet—40°06'22" N., 74°01'46" W.; 40°06'38" N., 74°01'39" W.

East Rockaway—40°34'36" N., 73°49'00" W.; 40°35'06" N., 73°47'06" W.; 40°34'10" N., 73°48'36" W.; 40°34'12" N., 73°47'17" W.

Jones Inlet—40°34'32" N., 73°39'14" W.; 40°-34'32" N., 73°37'06" W.; 40°33'48" N., 73°-37'06" W.; 40°33'48" N., 73°39'14" W.

Fire Island—40°36'49" N., 73°23'50" W.; 40°-37'12" N., 73°21'30" W.; 40°36'41" N., 73°-21'20" W.; 40°36'10" N., 73°23'40" W.

Mud Dump—40°23'48" N., 73°51'28" W.; 40°-21'48" N., 73°50'00" W.; 40°21'48" N., 73°-51'28" W.; 40°23'48" N., 73°50'00" W.

Shark River—40°12'48" N., 73°59'45" W.; 40°12'44" N., 73°59'06" W.; 40°11'36" N., 73°59'28" W.; 40°11'42" N., 74°00'12" W.

Rockaway Inlet—40°32'30" N., 73°55'00" W.; 40°32'30" N., 73°54'00" W.; 40°32'00" N., 73°54'00" W.; 40°32'00" N., 73°55'00" W.

San Juan Harbor—18°30'10" N., 66°08'29" W.; 18°30'10" N., 66°09'31" W.

Mayaguez Harbor—18°14'30" N., 67°13'29" W.; 18°15'30" N., 67°14'31" W.

Arecibo Harbor—18°30'00" N., 66°42'45" W.; 18°31'00" N., 66°43'47" W.

Ponce Harbor—17°55'30" N., 66°38'29" W.; 17°54'30" N., 66°39'31" W.

Dam Neck—36°50'06" N., 75°53'17" W.; °36-46'28" N., 75°53'17" W.; 36°46'28" N., 75°-54'19" W.; 36°50'05" N., 75°54'19" W.

Wilmington Harbor, NC—Hopper dredge disposal in area east of a line beginning 33°-50'00" and 78°02'30" to 33°48'45" and 78°-04'00" to 33°46'00" and 78°05'00".

Morehead City Harbor—Maintenance dredging hoper dredge disposal area 3 miles x 3 miles; aproximate latitude and longitude, bounded north 34°40'00", south 34°38'30", east 76°41'00", west 76°43'00".

Georgetown Harbor—33°11'18" N., 79°07'20" W.; 33°11'18" N., 79°05'23" W.; 33°10'38" N., 79°07'21" W.; 33°10'38" N., 79°05'24" W.

Charleston Harbor—32°18'06" N., 79°41'57" W.; 32°40'42" N., 79°47'30" W.; 32°39'04" N., 79°48'21" W.; 32°36'28" N., 79°43'48" W.

Port Royal Harbor—32°10'11" N., 80°36'00" W.; 32°10'06" N., 80°36'35" W.; 32°08'41" N., 80°35'40" W.; 32°08'38" N., 80°36'23" W.

Port Royal Harbor—32°05'46" N., 80°35'30" W.; 32°05'42" N., 80°36'27" W.; 32°04'27" N., 80°35'16" W.; 32°04'22" N., 80°36'16" W.

Brunswick Harbor—Atlantic outlet, Ga., St. Simons Sound, Brunswick Harbor Bar Channel, maintenance dredging disposal area 1 nautical mile wide by 2 nautical miles long adjacent to the channel located on the south side of the entrance and being 6.6 nautical miles from shore at a point of beginning at 31°02'35" N. and 81°17'40" W., thence due east to 31°02'35" N. and 81°16'30" W., thence due south to 31°00'-30" N. and 81°16'30" W., thence due west to 31°00'30" N. and 81°16'30" W., thence due north to the point of beginning.

Savannah River—Atlantic outlet, Ga., Savannah River Bar Channel, maintenance dredging disposal area 2 nautical miles wide by 2 nautical miles long adjacent to the channel, located on the southeast side and being 6 nautical miles from shore at point of beginning at 31°57'55" N. and 80°46'58" W., thence due east to 31°57'55" N. and 80°44'20" W., thence due south to 31°55'53" N. and 80°46'48" W., thence northward to the point of beginning.

Canaveral Harbor—28°19'53" N., 80°31'08" W.; 28°18'50" N., 80°29'40" W.; 28°17'35" N., 80°30'52" W.; 28°18'38" N., 80°32'20" W.

Fort Pierce Harbor—27°28'30" N., 80°12'33" W.; 27°28'30" N., 80°11'27" W.; 27°27'30" N., 80°11'27" W.; 27°27'30" N., 80°12'33" W.

Jacksonville Harbor—30°21'30" N., 81°18'34" W.; 30°21'30" N., 81°17'26" W.; 30°20'30" N., 81°17'26" W.; 30°20'30" N., 81°18'34" W.

Miami Beach—25°45'30" N., 80°03'54" W.; 25°45'30" N., 80°02'50" W.; 25°44'30" N., 80°02'50" W.; 25°44'30" N., 80°03'54" W.

Palm Beach Harbor—26°46'10" N., 80°02'00" W.; 26°45'54" N., 80°02'06" W.; 26°45'54" N., 80°02'13" W.; 26°46'10" N., 80°02'07" W.

Port Everglades Harbor—26°07'00" N., 80°04'30" W.; 26°07'00" N., 80°03'30" W.; 26°06'00" N., 80°03'30" W.; 26°06'00" N., 80°04'30" W.

St. Augustine Harbor—29°51'33" N., 81°15'24" W.; 29°51'33" N., 81°15'00" W.; 29°50'33" N., 81°15'00" W.; 29°50'33" N., 81°15'24" W.

St. Augustine Harbor—29°55'04" N., 81°17'04" W.; 29°55'13" N., 81°16'11" W.; 29°54'30" N., 81°15'58" W.; 29°54'19" N., 81°16'51" W.

St. Lucie Inlet—27°09'58" N., 80°09'30" W.; 27°09'58" N., 80°08'42" W.; 27°09'52" N., 80°08'42" W.; 27°09'52" N., 80°09'30" W.

Charlotte Harbor—26°37'36" N., 82°19'55" W.; 26°37'36" N., 82°18'47" W.; 26°36'36" N., 82°18'47" W.; 26°36'36" N., 82°19'55" W.

Tampa Harbor—27°38'08" N., 82°55'06" W.; 27°38'08" N., 82°54'00" W.; 27°37'08" N., 82°54'00" W.; 27°37'08" N., 82°55'06" W.

Tampa Harbor—27°37'28" N., 83°00'09" W.; 27°37'34" N., 82°59'19" W.; 27°36'43" N., 82°59'13" W.; 27°36'37" N., 83°00'03" W.

Fernandina Harbor—30°42'00" N., 81°19'05" W.; 30°42'00" N., 81°17'55" W.; 30°41'00" N., 81°17'55" W.; 30°41'00" N., 81°19'05" W.

Ponce de Leon Inlet—29°06'05" N., 80°55'50" W.; 29°06'10" N., 80°55'40" W.; 29°05'34" N., 80°55'10" W.; 29°05'28" N., 80°55'20" W.

Ponce de Leon Inlet—29°04'46" N., 80°53'40" W.; 29°04'36" N., 80°53'40" W.; 29°04'36" N., 80°54'26" W.; 29°04'46" N., 80°54'26" W.

Palm Beach Harbor—26°46'00" N., 79°58'55" W.; 26°46'00" N., 79°57'47" W.; 26°45'00" N., 79°57'47" W.; 26°45'00" N., 79°58'55" W.

Largo Sound—25°06'06" N., 80°24'42" W.; 25°05'58" N., 80°24'05" W.; 25°05'50" N., 80°24'10" W.; 25°05'58" N., 80°24'47" W.

Key West—24°27'24" N., 81°45'38" W.; 24°27'24" N., 81°44'32" W.; 24°26'20" N., 81°44'32" W.; 24°26'20" N., 81°45'38" W.

Anclote, FL—28°09'00" N., 83°51'46" W.; 28°09'00" N., 83°50'54" W.; 28°08'30" N., 83°50'54" W.; 28°08'30" N., 83°51'46" W.

Pithlachascotee River, FL—28°17'02" N., 82°46'21" W.; 28°17'02" N., 82°45'12" W.; 28°16'25" N., 82°45'00" W.; 28°16'42" N., 82°45'00" W.; 28°16'42" N., 82°46'21" W.

Withlacoochee River, FL—29°59'54" N., 82°47'14" W.; 29°00'28" N., 82°46'06" W.; 29°00'14" N., 82°45'56" W.; 28°59'40" N., 82°47'06" W.

Withlacoochee River, FL—28°59'08" N., 82°48'48" W.; 28°59'32" N., 82°47'40" W.; 28°59'18" N., 82°47'32" W.; 28°58'54" N., 82°48'40" W.

Cedar Keys, FL—29°08'43" N., 83°07'53" W.; 29°08'43" N., 83°07'03" W.; 29°08'33" N., 83°07'03" W.; 29°08'33" N., 83°07'53" W.

Cedar Keys, FL—29°04'08" N., 83°04'06" W.; 29°04'01" N., 83°03'54" W.; 29°03'28" N., 83°04'12" W.; 29°03'35" N., 83°04'24" W.

Horseshoe Cove, FL—29°25'23" N., 83°17'53" W.; 29°25'18" N., 83°17'43" W.; 29°25'09" N., 83°17'49" W.; 29°25'14" N., 83°17'59" W.

Horseshoe Cove, FL—29°25'58" N., 83°17'32" W.; 29°25'53" N., 83°17'22" W.; 29°25'44" N., 83°17'28" W.; 29°25'49" N., 83°17'38" W.

Mobile, AL—30°10.0' N., 88°07.7' W.; 30°10.4' N., 88°05.2' W.; 30°09.4' N., 88°04.7' W.; 30°08.5' N., 88°05.2' W.; 30°08.5' N., 88°08.2' W.

Pascagoula, MS—30°11.9' N., 88°33.1' W.; 30°11.9' N., 88°32.3' W.; 30°11.6' N., 88°32.4' W.; 30°11.6' N., 88°32.1' W.; 30°10.5' N., 88°33.2' W.; 30°10.6' N., 88°34.0' W.

Gulfport, MS—30°12.0' N., 89°00.5' W.; 30°12.0' N., 88°59.5' W.; 30°11.0' N., 89°00.0' W.; 30°07.0' N., 88°56.5' W.; 30°06.6' N., 88°57.0' W.; 30°10.5' N., 89°00.6' W.

Gulfport, MS—30°11.3' N., 88°58.4' W.; 30°11.2' N., 88°57.5' W.; 30°07.6' N., 88°54.4' W.; 30°07.4' N., 88°54.8' W.

Pensacola, FL—30°16.8' N., 87°19.0' W.; 30°16.7' N., 87°18.3' W.; 30°16.3' N., 87°18.2' W.; 30°16.0' N., 87°19.4' W.; 30°16.5' N., 87°19.4' W.

Panama City, FL—30°07.1' N., 85°45.9' W.; 30°07.2' N., 85°45.5' W.; 30°06.9' N., 85°45.1' W.; 30°06.7' N., 85°45.6' W.

Port St. Joe, FL—29°50.9' N., 85°29.9' W.; 29°51.3' N., 85°29.5' W.; 29°49.2' N., 85°28.2' W.; 29°49.0' N., 85°28.8' W.

Port St. Joe, Fl.—29°53.9' N., 85°31.8' W.; 29°54.1' N., 85°31.3' W.; 29°52.2' N., 85°30.1' W.; 29°52.2' N., 85°30.8' W.

Sabine-Neches Waterway, Texas

Disposal Area No. 1—Beginning at lat. 29°28'03'', long. 93°41'14''; thence to lat. 29°26'11'', long. 93°41'14''; thence to lat. 29°26'11'', long. 93°44'14''; thence to point of beginning.

Disposal Area No. 2—Beginning at lat. 29°30'41'', long. 93°43'49''; thence to lat. 29°28'42'', long. 93°41'33''; thence to lat. 29°28'42'', long. 93°44'49''; thence to lat. 29°26'11'', long. 3°44'11''; thence to point of beginning.

Disposal Area No. 3—Beginning at lat. 29°34'24'', long. 93°48'13''; thence to lat. 29°32'47'', long. 93°46'16''; thence to lat. 29°32'06'', long. 93°46'29''; thence to lat. 29°31'42'', long. 93°48'16''; thence to lat. 29°32'59'', long. 93°49'48''; thence to point of beginning.

Disposal Area No. 4—Beginning at lat. 29°38'09'', long. 93°49'23''; thence to lat. 29°35'53'', long. 93°48'18''; thence to lat. 29°35'06'', long. 93°50'24''; thence to lat. 29°36'37'', long. 93°51'09''; thence to lat. 29°37'00'', long. 93°50'06''; thence to lat. 29°37'46'', long. 93°50'26''; thence to point of beginning.

Galveston Harbor and Channel, Texas

Disposal Area No. 1—Beginning at lat. 29°18'00'', long. 94°39'30''; thence to lat. 29°15'54'', long. 94°37'06''; thence to lat. 29°14'24'', long. 94°38'42''; thence to lat. 29°16'54'', long. 94°41'30''; thence to point of beginning.

Freeport Harbor, Texas

Disposal Area No. 1—Beginning at lat. 28°54'42'', long. 95°17'38''; thence to lat. 28°54'-3''; long. 95°16'54''; thence to lat. 28°53'48'', long. 95°17'27''; thence to lat. 28°54'21'', long. 95°18'03''; thence to point of beginning.

Matagorda Ship Channel

Disposal Area No. 1—Beginning at lat. 28°24'31'', long. 96°18'48''; thence to lat. 28°23'27'', long. 96°17'38''; thence to lat. 28°23'15'', long 96°17'54''; thence to lat. 28°24'18'', long. 96°19'03''; thence to point of beginning.

Corpus Christi Ship Channel

Disposal Area No. 1—Beginning at lat. 27°49'34'', long. 97°01'51''; thence to lat. 27°48'28'', long. 96°59'49''; thence to lat. 27°48'18'', long. 96°59'56''; thence to lat. 27°49'23'', long. 97°01'58''; thence to point of beginning.

Port Mansfield Channel

Disposal Area No. 1—Beginning at lat. 26°34'09'', long. 97°15'52''; thence to lat. 26°34'09'', long. 97°15'18''; thence to lat. 26°33'57'', long. 97°15'18''; thence to lat. 26°33'57'', long. 97°15'52''; thence to point of beginning.

Disposal Area No. 1-A—Beginning at lat. 26°34'17'', long. 97°16'12''; thence to lat. 26°34'18'', long. 97°15'55''; thence to lat. 26°33'59'', long. 97°15'52''; thence to lat. 26°33'58'', long. 97°16'11''; thence to point of beginning.

Brazos Island Harbor

Disposal Area No. 1—Beginning at lat. 26°04'38'', long. 97°07'52''; thence to lat. 26°04'38'', long. 97°06'42''; thence to lat. 26°04'05'', long. 97°06'42''; thence to lat. 26°04'05'', long. 97°07'52''; thence to point of beginning.

Mississippi River, Gulf Outlet, La.—Breton Sound and Bar Channel. Maintenance dredging disposal area 0.5 mile wide by 12.5 miles long, parallel to the channel and located on the south side. Beginning at 29°32'23'' N. and 89°12'20'' W., following channel centerline (azimuth 308°47') in Breton Sound to 29°29'15'' N. and 89°07'06'' W., following centerline (azimuth 300°36') of the gulf entrance channel to 29°25'06'' N. and 88°59'54'' W., thence to 29°24'45'' N. and 89°00'09'' W., thence to 29°28'53'' N., and 89°08'08'' W., thence to 29°31'41'' N. and 89°12'09'' W., thence to the point of beginning.

Mississippi River, Baton Rouge to the Gulf of Mexico, La.—South Pass. Maintenance dredging disposal area 0.5 mile square, parallel to the channel and located on the west side. Beginning at 28°58'33'' N. and 89°07'00'' W., following channel centerline (azimuth 295°41') of the gulf entrance channel to 28°58'24'' N. and 89°06'30'' W., thence to 28°57'54'' N. and 89°06'42'' W., thence to 28°58'06'' N. and 89°07'18'' W., thence to the point of beginning.

Mississippi River, Baton Rouge to the Gulf of Mexico, La.—Southwest Pass. Maintenance dredging disposal area 2 miles square, parallel to the channel and located on the west side. Beginning at 28°54'24'' N. and 89°26'03'' W., following channel centerline (azimuth 0°09') of the gulf entrance channel to 28°52'18'' N. and 89°26'03'' W., thence to 28°52'18'' N. and 89°27'48'' W., thence to 28°54'24'' N. and 89°27'48'' W., thence to the point of beginning.

Mississippi River Outlets, Venice, La.—Tiger Pass. Maintenance dredging disposal area 0.5 mile wide by 1.5 miles long, parallel to the channel and located on the north side. Beginning at 29°08'18'' N. and 89°25'45'' W., following channel centerline (azimuth 63°54') of the gulf entrance channel to 29°07'36'' N. and 89°26'51'' W., thence to 29°07'48'' N. and 89°27'00'' W., thence to 29°08'36'' N. and 89°25'57'' W., thence to the point of beginning.

Waterway from Empire, La. to the Gulf of Mexico—Bar channel. Maintenance dredging disposal area 0.5 mile wide by 1 mile long, parallel to the channel and located on the west side. Beginning at 29°15'06'' N. and 89°36'30'' W., following channel centerline (azimuth 11°08') of the gulf entrance channel to 29°14'30'' N. and 89°36'36'' W., thence to 29°14'36'' N. and 89°36'48'' W., thence to 29°15'12'' N. and 89°36'42'' W., thence to the point of beginning.

Barataria Bay Waterway, La.—Bar channel. Maintenance dredging disposal area 0.5 mile wide by 2 miles long, parallel to the channel and located on the east side. Beginning at 29°16'18'' N. and 89°56'12'' W., following channel centerline (azimuth 312°07') of the gulf entrance channel to 29°14'42'' N. and 89°54'36'' W., thence to 29°14'30'' N. and 89°54'24'' W., thence to 29°16'06'' N. and 89°56'24'' W., thence to the point of beginning.

Bayou Lafourche and Lafourche—Jump Waterway, La.—Bell Pass. Maintenance dredging disposal area 2,000 feet wide by 1.5 miles long, parallel to the channel and located on the west side. Beginning at 29°05'00'' N. and 90°13'45'' W., following Bell Pass centerline (azimuth 12°55') in the gulf entrance channel to 29°03'51'' N. and 90°14'06'' W., thence to 29°03'57'' N. and 90°14'21'' W., thence to 29°05'06'' N. and 90°14'03'' W., thence to the point of beginning.

Houma Navigation Canal, La.—Cat Island Pass. Maintenance dredging disposal area 0.5 mile wide by 5 miles long, parallel to the Cat Island channel and located on the west side. Beginning at 29°04'45'' N. and 90°34'48'' W., following Cat Island centerline (azimuth 358°41') of the gulf entrance channel to 29°03'42'' N. and 90°34'34'' W., following Cat Island centerline (azimuth 354°00') of the gulf entrance channel to 29°00'24'' N. and 90°34'12'' W., thence to 29°00'21'' N. and 90°34'36'' W., thence to 29°03'42'' N. and 90°34'58'' W., thence to 29°04'48'' N. and 90°35'18'' W., thence to the point of beginning.

Atchafalaya River—Morgan City to the Gulf of Mexico, La. and Atchafalaya River and Bayous Chene, Boeuf and Black, La.—Bar channel. Maintenance dredging disposal area 0.5 mile wide by 12 miles long, parallel to the bar channel and located on the east side. Beginning at 29°20'50'' N. and 91°24'03'' W., following channel centerline (azimuth 37°57') of the gulf entrance channel to 29°11'35'' N. and 91°32'10'' W., thence to 29°11'21'' N. and 91°31'37'' W., thence to 29°20'36'' N. and 91°23'27'' W., thence to the point of beginning.

Freshwater Bayou, La.—Bar channel. Maintenance dredging disposal area 2,000 feet wide by 3.5 miles long, parallel to the channel and located on the west side. Beginning at 29°32'00'' N. and 92°18'48'' W., following channel centerline (azimuth 09°25') of the gulf entrance to 29°28'24'' N. and 92°19'30'' W., thence to 29°28'25'' N. and 92°19'42'' W., thence to 29°32'01'' N. and 92°19'00'' W., thence to the point of beginning.

Mermentau River, La. Maintenance dredging disposal areas 0.5 mile wide and 1.5 miles long, parallel to the entrance channels in the Lower Mermentau River and in the Lower Mud Lake, both located on the west side:

Disposal Area "A", Mermentau River, La. Beginning at 29°44'48'' N. and 93°07'12'' W., following channel centerline (azimuth 256°59') of the gulf entrance to 29°43'39'' N. and 93°07'36'' W., thence to 29°43'42'' N. and 93°07'48'' W., thence to 29°44'51'' N. and 93°07'24'' W., thence to the point of beginning.

Disposal Area "B", Mermentau River, La. Beginning at 29°43'24'' N. and 93°01'54'' W., following channel centerline (azimuth 359°50') of the gulf entrance to 29°42'33'' N. and 93°02'12'' W., thence to 29°42'36'' N. and 93°02'24'' W., thence to 29°43''27'' N. and 93°02'06'' W., thence to the point of beginning.

Calcasieu River and Pass, La.—Bar channel. Maintenance dredging disposal areas A through G parallel to the channel and located on the east and west side:

Disposal Area "A", Calcasieu River and Pass, La. Maintenance dredging disposal area one mile square parallel to the bar channel on the west bank. Beginning at 29°45'09'' N. and 93°20'42'' W., following channel centerline (azimuth 351°50') of the first tangent gulfward in the gulf entrance channel to 29°44'39'' N. and 93°20'36'' W., thence to 29°44'36'' N. and 93°21'33'' W., thence to 29°45'12'' N. and 93°21'42'' W., thence to the point of beginning.

Disposal Area "B", Calcasieu River and Pass, La. Maintenance dredging disposal area 1 mile square parallel to the bar channel and located on the east bank. Beginning at 29°45'27'' N. and 93°20'33'' W., following channel centerline (azimuth 351°50') of the first tangent gulfward in the gulf entrance channel to 29°44'42'' N. and 93°20'24'' W., thence to 29°44'45'' N. and 93°19'30'' W., thence to 29°45'39'' N. and 93°19'36'' W., thence to the point of beginning.

Disposal Area "C", Calcasieu River and Pass, La. Maintenance dredging disposal area 1 mile wide by 5.5 miles long, parallel to the bar channel and located on the west side. Beginning at 29°44'30" N. and 93°20'36" W., following channel centerline (azimuth 351°50') of the first tangent gulfward in the gulf entrance channel to 29°39'48" N. and 93°19'48" W., thence to 29°39'42" N. and 93°20'48" W., thence to 29°44'24" N. and 93°21'30" W., thence to the point of beginning.

Disposal Area "D", Calcasieu River and Pass, La. Maintenance dredging disposal area 1 mile wide by 5.5 miles long, parallel to the bar channel and located on the west side. Beginning at 29°37'48" N. and 93°19'24" W., following channel centerline (azimuth 351°50') of the first tangent gulfward in the gulf entrance channel to 29°37'24" N. and 93°19'24" W., following channel centerline (azimuth 321°37') of the second tangent gulfward in the gulf entrance channel to 29°34'12" N. and 93°16'18" W., thence to 29°33'06" N. and 93°16'36" W., thence to 29°37'24" N. and 93°20'24" W., thence to 29°37'48" N. and 93°20'24" W., thence to the point of beginning.

Disposal Area "E", Calcasieu River and Pass, La. Maintenance dredging disposal area 0.75 mile wide by 6.75 miles long, parallel to the bar channel and located on the west side. Beginning at 29°33'54" N. and 93°16'24" W., following channel centerline (azimuth 321°37') of the second tangent gulfward in the gulf entrance channel to 29°31'00" N. and 93°13'48" W., following channel centerline (azimuth 356°56') of the third tangent gulfward in the gulf entrance channel to 29°29'00" N. and 93°13'42" W. thence to 29°28'54" N. and 93°14'24" W., thence to 29°30'54" N. and 93°14'24" W., thence to 29°33'12" N. and 93°16'36" W., thence to the point of beginning.

Disposal Area "F", Calcasieu River and Pass, La. Maintenance dredging disposal area 0.75 mile wide by 2.5 miles long, parallel to the bar channel and located on the east side. Beginning at 29°44'42" N. and 93°20'12" W., following channel centerline (azimuth 351°50') of the first tangent gulfward in the gulf entrance channel to 29°42'36" N. and 93°19'48" W., thence to 29°42'42" N. and 93°19'06" W., thence to 29°44'48" N. and 93°19'24" W., thence to the point of beginning.

Disposal Area "G", Calcasieu River and Pass, La. Maintenance dredging disposal area 1 mile wide by 0.5 mile long, parallel to the bar channel and located on the west side. Beginning at 29°44'54" N., and 93°20'36" W., following channel centerline (azimuth 351°50') of the first tangent gulfward in the gulf entrance channel to 29°44'42" N., and 93°20'36" W., thence to 29°44'42" N., and 93°20'48" W., following channel centerline again to 29°44'30" N., and 93°20'42" W., thence to 29°44'24" N. and 93°21'30" W., thence to 29°44'48" N. and 93°21'30" W., thence to the point of beginning.

Crescent City Harbor—41°43'15" N., 124°12'10" W. (1,000 yd. diameter)

Crescent City 100 fathom—41°43'50" N., 124°28'00" W. (1,000 yd. diameter)

Humboldt Bay Harbor—40°45'44" N., 124°15'42" W. (500 yd. diameter)

Noyo River—39°25'45" N., 123°49'42" W. (500 yd. diameter)

Farallon Islands—37°31'45" N., 122°59'00" W. (1,000 yd. radius)

San Francisco Channel Bar—37°45'06" N., 122°35'45" W. (5,000 yds. x 1,000 yds.)

Moss Landing 100 fathom—36°37'53" N., 121°49'04" W. (500 yd. radius)

Port Hueneme—34°05'00" N., 119°14'00" W. (1,000 yd. radius)

Los Angeles—33°37'06" N., 118°17'24" W. (1,000 yd. radius)

Newport Beach—33°31'42" N., 117°54'48" W. (1,000 yd. radius)

San Diego—Point Loma—32°35'00" N., 117°17'30" W. (1,000 yd. radius)

San Diego 100 fathom—32°36'50" N., 117°20'40" W. (1,000 yd. radius)

Honolulu Harbor—21°14'30" N., 157°54'30" W. (1,000 yd. radius)

Kauai—Nawiliwili—21°55'30" N., 159°17'00" W. (1,000 yd. radius)

Kauai—Hanapepe—21°50'18" N., 159°35'30" W. (1,000 yd. radius)

Guam—Apra Harbor—13°29'30" N., 144°34'30" E. (1,000 yd. radius)

American Samoa—Pago Pago Harbor—14°23'00" S., 170°39'30" W. (1,000 yd. radius)

Mouth of Columbia River—46°1[illegible]37" N., 124°10'34" W.; 46°13'53" N., 124°10'01" W.; 46°13'43" N., 124°10'26" W.; 46°14'28" N., 124°10'59" W.

Mouth of Columbia River—46°13'03" N., 124°06'17" W.; 46°12'50" N., 124°05'55" W.; 46°12'13" N., 124°06'43" W.; 46°12'26" N., 124°07'05" W.

Mouth of Columbia River—46°15'43" N., 124°05'21" W.; 46°15'36" N., 124°05'11" W.; 46°15'11" N., 124°05'53" W.; 46°15'18" N., 124°06'03" W.

Mouth of Columbia River—46°12'12" N., 124°09'00" W.; 46°12'00" N., 124°08'42" W.; 46°11'48" N., 124°09'00" W., 46°12'00" N., 124°09'18" W.

Mouth of Columbia River—46°12'05" N., 124°05'46" W.; 46°11'52" N., 124°05'25" W.; 46°11'15" N., 124°06'14" W.; 46°11'28" N., 124°06'35" W.

Chetco River Entrance—42°01'56" N., 124°16'33" W.; 42°01'56" N., 124°16'09" W.; 42°01'38" N., 124°16'09" W.; 42°01'38" N., 124°16'33" W.

Rogue River Entrance—42°24'16" N., 124°26'48" W.; 42°24'04" N., 124°26'35" W.; 42°23'40" N., 124°27'13" W.; 42°23'52" N., 124°27'26" W.

Coquille River Entrance—43°07'54" N., 124°27'04" W.; 43°07'30" N., 124°26'27" W.; 43°07'20" N., 124°26'40" W.; 43°07'44" N., 124°27'17" W.

Coos Bay Entrance—43°21'59" N., 124°22'45" W.; 43°21'48" N., 124°21'59" W.; 43°21'35" N., 124°22'05" W.; 43°21'46" N., 124°22'51" W.

Coos Bay Entrance—43°22'44" N., 124°22'18" W.; 43°22'29" N., 124°21'34" W.; 43°22'16" N., 124°21'42" W.; 43°22'31" N., 124°22'26" W.

Umpqua River Entrance—43°40'07" N., 124°14'18" W.; 43°40'07" N., 124°13'42" W.; 43°39'53" N., 124°13'42" W.; 43°39'53" N., 124°14'18" W.

Suislaw River Entrance—44°01'32" N., 124°09'37" W.; 44°01'22" N., 124°09'02" W.; 44°01'14" N., 124°09'07" W.; 44°01'24" N., 124°09'42" W.

Tillamook Bay Entrance—45°34'09" N., 123°59'37" W.; 45°34'09" N., 123°58'45" W.; 45°33'55" N., 123°58'45" W.; 45°33'55" N., 123°59'37" W.

Depoe Bay—44°48'33" N., 124°03'53" W.; 44°48'32" N., 124°03'43" W.; 44°48'15" N., 124°03'45" W.; 44°48'16" N., 124°03'55" W.

Depoe Bay—44°48'09" N., 124°05'05" W.; 44°48'09" N., 124°04'55" W.; 44°47'53" N., 124°04'55" W.; 44°47'53" N., 124°05'05" W.

Yaquina Bay and Harbor Entrance—44°36'31" N., 124°06'04" W.; 44°36'31" N., 124°05'16" W.; 44°36'17" N., 124°05'16" W.; 44°36'17" N., 124°06'04" W.

Port Orford—42°44'08" N., 124°29'38" W.; 42°44'08" N., 124°29'28" W.; 42°43'52" N., 124°29'38" W.; 42°43'52" N., 124°29'38" W.

Willapa Bay—46°44'00" N., 124°10'00" W.; 46°39'00" N., 124°09'00" W.

Nome—64°30'40" N., 165°25'52" W.; 64°29'18" N., 165°26'04" W.; 64°29'13" N., 165°25'22" W.; 64°29'54" N., 165°24'45" W.

Anchorage Harbor—61°14'07" N., 149°53'56" W.; 61°14'16" N., 149°54'15" W.; 61°14'45" N., 149°53'36" W.; 61°14'36" N., 149°53'17" W.

(b) The following sites are designated "Approved Ocean Dumping Sites" for continuing use, subject to the listed restrictions:

(1) Gulf Ocean Incineration Site—Region VI. Location—Latitude and Longitude—27°06'12" N., 93°24'15" W.; 26°32'24" N., 93°15'30" W.; 26°19'00" N., 93°56'00" W.; 26°52'40" N., 94°04'40" W.

Size—(square miles) 1892.

Depth—(feet) 4500.

Primary Use: At sea incineration primarily for organochlorine wastes. Incineration of other wastes will require research studies or equivalent technical documentation to determine acceptability for ocean incineration.

Period of use: Until September 15, 1981.

Restriction: Only one ship will be permitted to burn wastes at a time, except under extreme emergencies.

§ 228.13 Guidelines for ocean disposal site baseline or trend assessment surveys under Section 102 of the Act.

The purpose of a baseline or trend assessment survey is to determine the physical, chemical, geological, and biological structure of a proposed or existing disposal site at the time of the survey. A baseline or trend assessment survey is to be regarded as a comprehensive synoptic and representative picture of existing conditions; each such survey is to be planned as part of a continual monitoring program through which changes in conditions at a disposal site can be documented and assessed. Surveys will be planned in coordination with the ongoing programs of NOAA and other Federal, State, local, or private agencies with missions in the marine environment. The field survey data collection phase of a disposal site evaluation or designation study shall be planned and conducted to obtain a body of information both representative of the site at the time of study and obtained by techniques reproducible in precision and accuracy in future studies. A full plan of study which will provide a record of sampling, analytical, and data reduction procedures must be developed, documented and approved by the EPA management authority. Plans for all surveys which will produce information to be used in the preparation of environmental impact statements will be approved by the Administrator or his designee. This plan of study also shall be incorporated as an appendix into a technical report on the study, together with notations describing deviations from the plan required in actual operations. Relative emphasis on individual aspects of the environment at each site will depend on the type of wastes disposed of at the site and the manner in which such wastes are likely to affect the local environment, but no major feature of the disposal site may be neglected. The observations made and the data obtained are to be based on the information necessary to evaluate the site for ocean dumping. The parameters measured will be those indicative, either directly or in directly, of the immediate and long-term impact of pollutants on the environment at the disposal site and adjacent land or water areas. An initial disposal site evaluation or designation study should provide an immediate baseline appraisal of a particular site, but it should also be regarded as the first of a series of studies to be continued as long as the site is used for waste disposal.

(a) *Timing.* Baseline or trend assessment surveys will be conducted with due regard for climatic and seasonal impact on stratification and other conditions in the upper layers of the water column. Where a choice of season is feasible, trend assessment surveys should be made during those months when pollutant accumulation within disposal sites is likely to be most severe, or when pollutant impact within disposal sites is likely to be most noticeable.

(1) Where disposal sites are near large riverine inflows to the ocean, surveys will be done with due regard for the seasonal variation in river flow. In some cases several surveys at various river flows may be necessary before a site can be approved.

(2) When initial surveys show that seasonal variation is not significant and surveys at greater than seasonal intervals are adequate for characterizing a site, resurveys shall be carried out in climatic conditions as similar to those of the original surveys as possible, particularly in depths less than 200 meters.

(b) *Duration.* The actual duration of a field survey will depend upon the size and depth of the site, weather conditions during the survey, and the types of data to be collected. For example, for a survey of an area of 100 square miles on the continental shelf, including an average dump site and the region contiguous to it, an on-site operation would be scheduled for completion within one week of weather suitable for on-site operations. More on-site operating time may be scheduled for larger or highly complex sites.

(c) *Numbers and Locations of Sampling Stations.* The numbers and locations of sampling stations will depend in part on the local bathymetry with minimum numbers of stations per site fixed as specified in the following sections. Where the bottom is smooth or evenly sloping, stations for water column measurements and benthic sampling and collections, other than trawls, shall be spaced throughout the survey area in a manner planned to provide maximum coverage of both the disposal site and contiguous control areas, considering known water movement characteristics. Where there are major irregularities in the bottom topography, such as canyons or gullies, or in the nature of the bottom, sampling stations for sediments and benthic communities shall be spaced to provide representative sampling of the major different features.

Sampling shall be done within the dump site itself and in the contiguous area. Sufficient control stations outside a disposal site shall be occupied to characterize the control area environment at least as well as the disposal site itself. Where there are known persistent currents, sampling in contiguous areas shall include at least two stations downcurrent of the dump site, and at least two stations upcurrent of the site.

(d) *Measurements in the Water Column at and near the Dump Site.*

(1) *Water Quality Parameters Measured.* These shall include the major indicators of water quality, particularly those likely to be affected by the waste proposed to be dumped. Specifically included at all stations are measurements of temperature, dissolved oxygen, salinity, suspended solids, turbidity, total organic carbon, pH, inorganic nutrients, and chlorophyll *a*.

(i) At one station near the center of the disposal site, samples of the water column shall be taken for the analysis of the following parameters: mercury, cadmium, copper, chromium, zinc, lead, arsenic, selenium, vanadium, beryllium, nickel, pesticides, petroleum hydrocarbons, and persistent organohalogens. These samples shall be preserved for subsequent analysis by or under the direct supervision of EPA laboratories in accordance with the approved plan of study.

(ii) These parameters are the basic requirements for all sites. For the evaluation of any specific disposal site additional measurements may be required, depending on the present or intended use of the site. Additional parameters may be selected based on the materials likely to be in wastes dumped at the site, and on parameters likely to be affected by constituents of such wastes. Analysis for other constituents characteristic of wastes discharged to a particular disposal site, or of the impact of such wastes on water quality, will be included in accordance with the approved plan of study.

(2) *Water Quality Sampling Requirements.* The number of samples collected from the water column should be sufficient to identify representative changes throughout the water column such as to avoid short-term impact due to disposal activities. The following key locations should be considered in selecting water column depths for sampling:

(i) Surface, below interference from surface waves;

(ii) Middle of the surface layer;

(iii) Bottom of the surface layer;

(iv) Middle of the thermocline or halocline, or both if present;

(v) Near the top of the stable layer beneath a thermocline or halocline;

(vi) Near the middle of a stable layer;

(vii) As near the bottom as feasible;

(viii) Near the center of any zone showing pronounced biological activity or lack thereof.

In very shallow waters where only a few of these would be pertinent, as a minimum, surface, mid-depth and bottom samples shall be taken, with samples at additional depths being added as indicated by local conditions. At disposal sites far enough away from the influence of major river inflows, ocean or coastal currents, or other features which might cause local perturbations in water chemistry, a minimum of 5 water chemistry stations should be occupied within the boundaries of a site. Additional stations should be added when the area to be covered in the survey is more than 20 square miles or when local perturbations in water chemistry may be expected because of the presence of one of the features mentioned above. In zones where such impacts are likely, stations shall be distributed so that at least 3 stations are occupied in the transition from one stable regime to another. Each water column chemistry station shall be replicated a minimum of 2 times during a survey except in waters over 200 meters deep.

(3) *Water Column Biota.* Sampling stations for the biota in the water column shall be as near as feasible to stations used for water quality; in addition at least two night-time stations in the disposal site and contiguous area are required. At each station vertical or oblique tows with appropriately-meshed nets shall be used to assess the microzooplankton, the nekton, and the macrozooplankton. Towing times and distances shall be sufficient to obtain representative samples of organisms near water quality stations. Organisms shall be sorted and identified to taxonomic levels necessary to identify dominant organisms, sensitive or indicator organisms, and organism diversity. Tissue samples of representative species shall be analyzed for pesticides, persistent organohalogens, and heavy metals. Discrete water samples shall also be used to quantitatively assess the phytoplankton at each station.

These requirements are the minimum necessary in all cases. Where there are discontinuities present, such as thermoclines, haloclines, convergences, or upwelling, additional tows shall be made in each water mass as appropriate.

(e) *Measurements of the Benthic Region.*

(1) *Bottom Sampling.* Samples of the bottom shall be taken for both sediment composition and structure, and to determine the nature and numbers of benthic biota.

(i) At each station sampling may consist of core samples, grab samples, dredge samples, trawls, and bottom photography or television, where available and feasible, depending on the nature of the bottom and the type of disposal site. Each type of sampling shall be replicated sufficiently to obtain a representative set of samples. The minimum numbers of replicates of successful samples at each continental shelf station for each type of device mentioned above are as follows:

Cores	3.
Grabs	5.
Dredge	3.
Trawl	20-min. tow.

Lesser numbers of replicates may be allowed in water deeper than 200 meters, at those sites where pollution impacts on the bottom are unlikely in the judgment of the EPA management authority.

(ii) Selection of bottom stations will be based to a large extent on the bottom topography and hydrography as determined by the bathymetric survey. On the continental shelf, where the bottom has no significant discontinuities, a

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bottom station density of at least three times the water column stations is recommended, depending on the type of site being evaluated. Where there are significant differences in bottom topography, additional stations shall be occupied near the discontinuity and on each side of it. Beyond the continental shelf, lesser densities may be used.

(2) *Bathymetric Survey.* Sufficient tracklines shall be run to develop complete bottom coverage of bathymetry with reasonable assurance of accurate coverage of bottom topography, with trackline direction and spacing as close as available control allows. The site itself is to be developed at the greatest density possible, with data to be collected to a suitable distance about the site as is required to identify major changes in bathymetry which might affect the site. Specifications for each bathymetric survey will vary, depending on control, bottom complexity, depths, equipment, and map scale required. In most cases, a bathymetric map at a scale of 1:25,000 to 1:10,000 will be required, with a minimum of 1-5 meter contour interval except in very flat areas. When the foregoing bathymetric detail is available from recent surveys of the disposal site, bathymetry during a baseline or trend assessment survey may be limited to sonar profiles of bathymetry on transects between sampling stations.

(3) *Nature of Bottom.* The size distribution of sediments, mineral character and chemical quality of the bottom will be determined to a depth appropriate for the type of bottom. The following parameters will be measured at all stations: particle size distribution, major mineral constituents, texture, settling rate, and organic carbon.

(i) At several stations near the center of the disposal site, samples of sediments shall be taken for the analysis of the following parameters: mercury, cadmium, copper, chromium, zinc, lead, arsenic, selenium, vanadium, beryllium, nickel, pesticides, persistent organohalogens, and petroleum hydrocarbons. These samples shall be preserved for subsequent analysis by or under the direct supervision of EPA laboratories in accordance with the approved plan of study.

(ii) These parameters are the basic requirements for all sites. For the evaluation of any specific disposal site additional measurements may be required, depending on the present or intended use of the site. Additional parameters may be selected based on the materials likely to be in wastes dumped at the site, and on parameters likely to be affected by constituents of such wastes. Such additional parameters will be selected by the EPA management authority .

(4) *Benthic Biota.* This shall consist of a quantitative and qualitative evaluation of benthic communities including macroinfauna and macroepifauna, meiobenthos, and microbenthos, and should include an appraisal, based on existing information, of the sensitivity of indigenous species to the waste proposed to be discharged. Organisms shall be sorted, and identified to taxonomic levels necessary to identify dominant organisms, sensitive or indicator organisms, and organism diversity. Tissue samples of the following types of organisms shall be analyzed for persistent organohalogens, pesticides, and heavy metals:

(i) A predominant species of demersal fish;

(ii) The most abundant macroinfaunal species; and

(iii) A dominant epifaunal species, with particular preference for a species of economic importance.

(f) *Other Measurements.*

(1) *Hydrodynamic Features.* The direction and speed of water movement shall be characterized at levels appropriate for the site and type of waste to be dumped. Where depths and climatic conditions are great enough for a thermocline or halocline to exist, the relationship of water movement to such a feature shall be characterized.

(i) *Current Measurements.* When current meters are used as the primary source of hydrodynamic data, at least 4 current meter stations with at least 3 meters at depths appropriate for the observed or expected discontinuities in the water column should be operated for as long as possible during the survey. Where feasible, current meters should be deployed at the initiation of the survey and recovered after its completion. Stations should be at least a mile apart, and should be placed along the long axis of the dumping site. For dumping sites more than 10 miles along the long axis, one current meter station every 5 miles should be operated. Where there are discontinuities in surface layers, e.g., due to land runoff, stations should be operated in each water mass.

(ii) *Water Mass Movement.* Acceptable methods include: dye, drogues, surface drifters, side scan sonar, bottom drifters, and bottom photography or television. When such techniques are the primary source of hydrodynamic data, coverage should be such that all significant hydrodynamic features likely to affect waste movement are measured.

(2) *Sea State.* Observations of sea state and of standard meteorological parameters shall be made at 8-hour intervals.

(3) *Surface Phenomena.* Observations shall be made of oil slicks, floating materials, and other visible evidence of pollution; and, where possible, collections of floating materials shall be made.

(g) *Survey Procedures and Techniques.* Techniques and procedures used for sampling and analysis shall represent the state-of-the-art in oceanographic survey and analytical practice. Survey plans shall specify the methods to be used and will be subject to approval by EPA.

(h) *Quality Assurance.* The EPA management authority may require that certain samples be submitted on a routine basis to EPA laboratories for analysis as well as being analyzed by the surveyor, and that EPA personnel participate in some field surveys.

PART 229—GENERAL PERMITS

Sec.
229.1 Burial at sea.
229.2 Transport of target vessels.
229.3 Transportation and disposal of vessels.

AUTHORITY: 33 U.S.C. 1412 and 1418.

§ 229.1 Burial at sea.

(a) All persons subject to Title I of the Act are hereby granted a general permit to transport human remains from the United States and all persons owning or operating a vessel or aircraft registered in the United States or flying the United States flag and all departments, agencies, or instrumentalities of the United States are hereby granted a general permit to transport human remains from any location for the purpose of burial at sea and to bury such remains at sea subject to the following conditions:

(1) Except as herein otherwise provided, human remains shall be prepared for burial at sea and shall be buried in accordance with accepted practices and requirements as may be deemed appropriate and desirable by the United States Navy, United States Coast Guard, or civil authority charged with the responsibility for making such arrangements;

(2) Burial at sea of human remains which are not cremated shall take place no closer than three nautical miles from land and in water no less than one hundred fathoms (six hundred feet) deep and in no less than three hundred fathoms (eighteen hundred feet) from (i) 27°30'00" to 31°00'00" North Latitude off St. Augustine and Cape Canaveral, Florida; (ii) 82°20'00" to 84°00'00" West Longitude off Dry Tortugas, Florida; and (iii) 87°15'00" to 89°50'00" West Longitude off the Mississippi River Delta, Louisiana, to Pensacola, Florida. All necessary measures shall be taken to ensure that the remains sink to the bottom rapidly and permanently; and

(3) Cremated remains shall be buried in or on ocean waters without regard to the depth limitations specified in paragraph (a)(2) of this Section provided that such burial shall take place no closer than three nautical miles from land.

(b) For purposes of this Section and §§ 229.2 and 229.3, "land" means that portion of the baseline from which the territorial sea is measured, as provided for in the Convention on the Territorial Sea and the Contiguous Zone, which is in closest proximity to the proposed disposal site.

(c) Flowers and wreaths consisting of materials which are readily decomposable in the marine environment may be disposed of under the general permit set forth in this Section at the site at which disposal of human remains is authorized.

(d) All burials conducted under this general permit shall be reported within 30 days to the Regional Administrator of the Region from which the vessel carrying the remains departed.

§ 229.2 Transport of target vessels.

(a) The United States Navy is hereby granted a general permit to transport vessels from the United States or from any other location for the purpose of sinking such vessels in ocean waters in testing ordnance and providing related data subject to the following conditions:

(1) Such vessels may be sunk at times determined by the appropriate Navy official;

(2) Necessary measures shall be taken to ensure that the vessel sinks to the bottom rapidly and permanently, and that marine navigation is not otherwise impaired by the sunk vessel;

(3) All such vessel sinkings shall be conducted in water at least 1000 fathoms (6000 feet) deep and at least 50 nautical miles from land, as defined in § 229.1(b); and

(4) Before sinking, appropriate measures shall be taken by qualified personnel at a Navy or other certified facility to remove to the maximum extent practicable all materials which may degrade the marine environment, including without limitation, (i) emptying of all fuel tanks and fuel lines to the lowest point practicable, flushing of such tanks and lines with water, and again emptying such tanks and lines to the lowest point practicable so that such tanks and lines are essentially free of petroleum, and (ii) removing from the hulls other pollutants and all readily detachable material capable of creating debris or contributing to chemical pollution.

(b) An annual report will be made to the Administrator of the Environmental Protection Agency setting forth the name of each vessel used as a target vessel, its approximate tonnage, and the location and date of sinking.

§ 229.3 Transportation and disposal of vessels.

(a) All persons subject to Title I of the Act are hereby granted a general permit to transport vessels from the United States, and all departments, agencies, or instrumentalities of the United States are hereby granted a general permit to transport vessels from any location for the purpose of disposal in the ocean subject to the following conditions:

(1) Except in emergency situations, as determined by the U.S. Army Corps of Engineers and/or the U.S. Coast Guard, the person desiring to dispose of a vessel under this general permit shall, no later than one month prior to the proposed disposal date, provide the following information in writing to the EPA Regional Administrator for the Region in which the proposed disposal will take place:

(i) A statement detailing the need for the disposal of the vessel;

(ii) Type and description of vessel(s) to be disposed of and type of cargo normally carried;

(iii) Detailed description of the proposed disposal procedures;

(iv) Information on the potential effect of the vessel disposal on the marine environment; and

(v) Documentation of an adequate evaluation of alternatives to ocean disposal (i.e., scrap, salvage and reclamation).

(2) Transportation for the purpose of ocean disposal may be accomplished under the supervision of the District Commander of the U.S. Coast Guard or his designee.

(3) Except in emergency situations, as determined by the U.S. Army Corps of Engineers and/or the District Commander of the U.S. Coast Guard, appropriate measures shall be taken, prior to disposal, by qualified personnel to remove to the maximum extent practicable all materials which may degrade the marine environment, including without limitation, (i) emptying of all fuel lines and fuel tanks to the lowest point practicable, flushing of such lines and tanks with water, and again emptying such lines and tanks to the lowest point practicable so that such lines and tanks are essentially free of petroleum, and (ii) removing from the hulls other pollutants and all readily detachable material capable of creating debris or contributing to chemical pollution.

(4) Except in emergency situations, as determined by the U.S. Army Corps of Engineers and/or the U.S. Coast Guard, the dumper shall, no later than 10 days prior to the proposed disposal date, notify the EPA Regional Administrator and the District Commander of the U.S. Coast Guard that the vessel has been cleaned and is available for inspection; the vessel may be transported for dumping only after EPA and the Coast Guard agree that the requirements of paragraph (a)(3) of this Section have been met.

(5) Disposal of these vessels shall take place in a site designated on current nautical charts for the disposal of wrecks or no closer than twenty-two kilometers (twelve miles) from the nearest land and in water no less than fifty fathoms (three hundred feet) deep, and all necessary measures shall be taken to ensure that the vessels sink to the bottom rapidly and that marine navigation is not otherwise impaired.

(6) Disposal shall not take place in established shipping lanes unless at a designated wreck site, nor in a designated marine sanctuary, nor in a location where the hulk may present a hazard to commercial trawling or national defense (see 33 CFR 205).

(7) Except in emergency situations, as determined by the U.S. Army Corps of Engineers and/or the U.S. Coast Guard, disposal of these vessels shall be performed during daylight hours only.

(8) Except in emergency situations, as determined by the U.S. Army Corps of Engineers and/or the District Commander of the U.S. Coast Guard, the Captain-of-the-Port (COTP), U.S. Coast Guard, and the EPA Regional Administrator shall be notified forty-eight (48) hours in advance of the proposed disposal. In addition, the COTP and the EPA Regional Administrator shall be notified by telephone at least twelve (12) hours in advance of the vessel's departure from port with such details as the proposed departure time and place, disposal site location, estimated time of arrival on site, and the name and communication capability of the towing vessel. Schedule changes are to be reported to the COTP as rapidly as possible.

(9) The National Ocean Survey, NOAA, 6010 Executive Blvd., Rockville, MD 20852, shall be notified in writing, within one week, of the exact coordinates of the disposal site so that it may be marked on appropriate charts.

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APPENDIX VII

Sludge Characteristics

Sludge Characteristics

Tables 1 and 2 show a range of typical municipal sludge properties. Sludges vary considerably from one plant to another and even from time to time within a given plant. Table 3 shows the variation in amounts of sludge for various wastewater treatment processes.

Another factor is the process used to treat the sludge once it is separated from the wastewater. Chemicals may be added as conditioning agents, thereby increasing the quantity of solids. Some processes, such as digestion, solubilize a portion of the solids and the trace elements, which can then be removed in a process-liquid sidestream, such as digester supernatant, for separate treatment.

The quantities of trace elements present in the sludge can have a significant effect on the options available for sludge use or disposal. There is not an extensive amount of knowledge about these constituents in the sludge, but representative data are given in Tables 4 thru 9.

Other constituents which may cause damage to the environment and should be considered when characterizing municipal sludges include organic chemicals known or suspected to be carcinogenic, organic chemicals which tend to persist or bioaccumulate in the environment, and pathogenic organisms.

Without pretreatment for removal of trace elements, industrial users of publicly owned treatment works may be a major source of such elements. Industrial users are not the only source, however, and it should not be presumed that all trace elements will be removed by a pretreatment program for industrial users.

Domestic wastes typically have significant quantities of trace elements, probably from the use of chemical products in the home, from exposure to metallic plumbing systems, and from street runoff. Additionally, it has been found that human feces may contain some of these materials.

Sludge characteristics may vary for many other reasons. Wastewater characteristics may change seasonally (because of industrial or recreational uses), with corresponding changes in the sludge. Process upsets, equipment malfunctions, or industrial spills also may change sludge properties.

In order to characterize a sludge, therefore, it is necessary to test periodically rather than rely on one test result. A single grab sample can be a valuable indicator, but a range in values is essential to determine the sludge properties.

Table 1. Typical chemical composition of raw and digested sludge[1]

Item	Raw primary sludge		Digested sludge	
	Range	Typical	Range	Typical
Total dry solids (TS), %	2.0-7.0	4.0	6.0-12.0	10.0
Volatile solids (% of TS)	60-80	65	30-60	40.0
Grease and fats (ether soluble, % of TS)	6.0-30.0	...	5.0-20.0	
Protein (% of TS)	20-30	25	15-20	18
Nitrogen (N, % of TS)	1.5-4.0	2.5	1.6-6.0	3.0
Phosphorus (P_2O_5, % of TS)	0.8-2.8	1.6	1.5-4.0	2.5
Potash (K_2O, % of TS)	0-1.0	0.4	0.0-3.0	1.0
Cellulose (% of TS)	8.0-15.0	10.0	8.0-15.0	10.0
Iron (not as sulfide)(mg/l)	2.0-4.0	2.5	3.0-8.0	4.0
Silica (SiO_2, % of TS)	15.0-20.0	...	10.0-20.0	
pH	5.0-8.0	6.0	6.5-7.5	7.0
Alkalinity (mg/l as $CaCO_3$)	500-1,500	600	2,500-3,500	3,000
Organic acids (mg/l as HAc)	200-2,000	500	100-500	200
Thermal content (Btu/lb)	6,800-10,000	7,600*	2,700-6,800	4,000**

*Based on 65 percent volatile matter.
**Based on 40 percent volatile matter.

Table 2. Concentrations of organic C, total N, P and S, NH_4 and NO_3 in sewage sludge.[2]

Component	Sample		Range	Median	Mean
	Type*	Number			
Organic C, %	Anaerobic	31	18- 39	26.8	27.6
	Aerobic	10	27- 37	29.5	31.7
	Other	60	6.5- 48	32.5	32.6
	All	101	6.5- 48	30.4	31.0
Total N, %	Anaerobic	85	0.5- 17.6	4.2	5.0
	Aerobic	38	0.5- 7.6	4.8	4.9
	Other	68	<0.1- 10.0	1.8	1.9
	All	191	<0.1- 17.6	3.3	3.9
NH_4-N, ppm	Anaerobic	67	120-67,600	1,600	9,400
	Aerobic	33	30-11,300	400	950
	Other	3	5-12,500	80	4,200
	All	103	5-67,600	920	6,540
NO_3-N, ppm	Anaerobic	35	2- 4,900	79	520
	Aerobic	8	7- 830	180	300
	Other	3	- - ---	---	780
	All	45	2- 4,900	140	490
Total P, %	Anaerobic	86	0.5- 14.3	3.0	3.3
	Aerobic	38	1.1- 5.5	2.7	2.9
	Other	65	<0.1- 3.3	1.0	1.3
	All	189	<0.1- 14.3	2.3	2.5
Total S, %	Anaerobic	19	0.8- 1.5	1.1	1.2
	Aerobic	9	0.6- 1.1	0.8	0.8
	Other	--	-- --	--	--
	All	28	0.6- 1.5	1.1	1.1

* "Other" includes lagooned, primary, tertiary and unspecified sludges. "All" signifies data for all types of sludges.

Table 3. Characteristics of sludges produced by various treatment processes[3]

Treatment processes	Pounds dry solids per million gallons	Gallons per million gallons sewage treated	Percent water in sludge
Primary settling	900-1,200	2,500-3,500	93-95
Activated sludge	600-900	15,000-20,000	98-99
Trickling filters (low loading	400-500	400-700	93-95
Trickling filters (high loading)	600-900	1,200-1,500	96-98
Chemical precipitation of raw sewage	3,000-4,500	4,000-6,000	90-93

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Table 4. Concentrations of K, Na, Ca, Mg, Ba, Fe and Al in sewage sludge[2]

Component	Sample Type*	Sample Number	Range	Median	Mean
				%	
K	Anaerobic	86	0.02- 2.64	0.30	0.52
	Aerobic	37	0.08- 1.10	0.38	0.46
	Other	69	0.02- 0.87	0.17	0.20
	All	192	0.02- 2.64	0.30	0.40
Na	Anaerobic	73	0.01- 2.19	0.73	0.70
	Aerobic	36	0.03- 3.07	0.77	1.11
	Other	67	0.01- 0.96	0.11	0.13
	All	176	0.01- 3.07	0.24	0.57
Ca	Anaerobic	87	1.9- 20.0	4.9	5.8
	Aerobic	37	0.6- 13.5	3.0	3.3
	Other	69	0.1- 25.0	3.4	4.6
	All	193	0.1- 25.0	3.9	4.9
Mg	Anaerobic	87	0.03- 1.92	0.48	0.58
	Aerobic	37	0.03- 1.10	0.41	0.52
	Other	65	0.03- 1.97	0.43	0.50
	All	189	0.03- 1.97	0.45	0.54
Ba	Anaerobic	27	<0.01- 0.90	0.05	0.08
	Aerobic	10	<0.01- 0.03	0.02	0.02
	Other	23	<0.01- 0.44	<0.01	0.04
	All	60	<0.01- 0.90	0.02	0.06
Fe	Anaerobic	96	0.1 -15.3	1.2	1.6
	Aerobic	38	0.1 - 4.0	1.0	1.1
	Other	31	<0.1 - 4.2	0.1	0.8
	All	165	<0.1 -15.3	1.1	1.3
Al	Anaerobic	73	0.1- 13.5	0.5	1.7
	Aerobic	37	0.1- 2.3	0.4	0.7
	Other	23	0.1- 2.6	0.1	0.3
	All	133	0.1- 13.5	0.4	1.2

* "Other" includes lagooned, primary, tertiary and unspecified sludges. "All" signifies data for all types of sludges.

Table 5. Concentrations of Mn, B, As, Co, Mo and Hg in sewage sludge[2]

Component	Sample		Range	Median	Mean
	Type*	Number			
				mg/kg	
Mn	Anaerobic	81	58- 7,100	280	400
	Aerobic	38	55- 1,120	340	420
	Other	24	18- 1,840	118	250
	All	143	18- 7,100	260	380
B	Anaerobic	62	12- 760	36	97
	Aerobic	29	17- 74	33	40
	Other	18	4- 700	16	69
	All	109	4- 760	33	77
As	Anaerobic	3	10- 230	116	119
	Aerobic	--	-- --	--	--
	Other	7	6- 18	9	11
	All	10	6- 230	10	43
Co	Anaerobic	4	3- 18	7.0	8.8
	Aerobic	--	-- --	--	--
	Other	9	1- 11	4.0	4.3
	All	13	1- 18	4.0	5.3
Mo	Anaerobic	9	24- 30	30	29
	Aerobic	3	30- 30	30	30
	Other	17	5- 39	30	27
	All	29	5- 39	30	28
Hg	Anaerobic	35	0.5-10,600	5	1,100
	Aerobic	20	1.0- 22	5	7
	Other	23	2.0- 5,300	3	810
	All	78	0.2-10,600	5	733

* "Other" includes lagooned, primary, tertiary and unspecified sludges.
"All" signifies data for all types of sludges.

Table 6. Concentrations of Pb, Zn, Cu, Ni, Cd and Cr in sewage sludge[2]

	Sample				
Component	Type*	Number	Range	Median	Mean
			mg/kg		
Pb	Anaerobic	98	58-19,730	540	1,640
	Aerobic	57	13-15,000	300	720
	Other	34	72-12,400	620	1,630
	All	189	13-19,700	500	1,360
Zn	Anaerobic	108	108-27,800	1,890	3,380
	Aerobic	58	108-14,900	1,800	2,170
	Other	42	101-15,100	1,100	2,140
	All	208	101-27,800	1,740	2,790
Cu	Anaerobic	108	85-10,100	1,000	1,420
	Aerobic	58	85- 2,900	970	940
	Other	39	84-10,400	390	1,020
	All	205	84-10,400	850	1,210
Ni	Anaerobic	85	2- 3,520	85	400
	Aerobic	46	2- 1,700	31	150
	Other	34	15- 2,800	118	360
	All	165	2- 3,520	82	320
Cd	Anaerobic	98	3- 3,410	16	106
	Aerobic	57	5- 2,170	16	135
	Other	34	4- 520	14	70
	All	189	3- 3,410	16	110
Cr	Anaerobic	94	24-28,850	1,350	2,070
	Aerobic	53	10-13,600	260	1,270
	Other	33	22-99,000	640	6,390
	All	180	10-99,000	890	2,620

* "Other" includes lagooned, primary, tertiary and unspecified sludges. "All" signifies data for all types of sludges.

Table 7. Typical metals in municipal sludges (mg/kg dry sludge)[4]

	Range	Mean	Median
Ag, Silver	nd$^{\alpha}$-960	225	90
As, Arsenic	10-50	9	8
B. Boron	200-1430	430	350
Ba, Barium	nd-3000	1460	1300
Be, Beryllium	nd	nd	nd
Cd, Cadmium	nd-1100	87	20
Co, Cobalt	nd-800	350	100
Cr. Chromium	22-30,000	1800	600
Cu, Copper	45-16,030	1250	700
Hg, Mercury	0.1-89	7	4
Mn, Manganese	100-8800	1190	400
Ni, Nickel	nd-2800	410	100
Pb, Lead	80-26,000	1940	600
Sr, Strontium	nd-2230	440	150
Se, Selenium	10-180	26	20
V, Vanadium	nd-2100	510	400
Zn, Zinc	51-28,360	3483	1800

Other possible contaminants: persistent organics, pathogens, radioactive substances

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[α] nd = not detected

Table 8. Metal content of digested municipal sludges[5]

Element	Purely Domestic[1]	Controlled Municipal[2]	Observed Maximum
Zn, ppm	750	2500	50,000
Cu, ppm	250	1000	17,000
Ni, ppm	25	200	8,000
Cd, ppm	5	25	3,410
Pb, ppm	150	1000	10,000
Hg, ppm	2	10	100
Cr, ppm	50	1000	30,000

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[1] Observed in sludges from newer suburban communities

[2] Typical of sludges from communities without excessive industrial waste sources or with adequate source abatement. R. Chaney, 4/76

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Table 9. Variability of Cd, Cu and Ni in sewage sludges[a]

Metal	Sludge No.	Range	Median	Mean	Coefficient of Variation
		mg/kg[b]			%[c]
Cd	1	109- 372	170	210	45
	2	4- 39	15	19	67
	3	483-1,177	806	846	27
	4	3- 150	40	53	95
	5	24- 756	663	503	63
	6	12- 163	12	43	160
	7	22- 256	154	136	69
	8	11- 32	11	16	54
Cu	1	4,083- 7,174	6,525	6,079	19
	2	5,741-11,875	8,386	8,381	27
	3	2,081- 3,510	2,390	2,594	21
	4	452- 802	683	662	18
	5	391- 6,973	476	1,747	167
	6	300- 1,800	682	778	67
	7	422- 1,392	894	871	47
	8	979- 1,475	1,144	1,154	15
Ni	1	1,932-4,016	3,543	3,184	27
	2	663-1,351	1,053	1,015	29
	3	468- 812	651	649	21
	4	75- 219	95	119	50
	5	40- 797	86	252	144
	6	46- 92	88	81	22
	7	47- 547	367	349	55
	8	65- 93	79	80	12

[a] Adapted from Sommers et al[6]

[b] Oven-dry basis

[c] Standard deviation expressed as a percentage of the mean

DATA SOURCES

[1] Metcalf & Eddy, Inc.; Wastewater Engineering: Collection, Treatment, and Disposal; McGraw-Hill, New York, N.Y., 1972.

[2] Sommers, L.E., "Chemical Composition of Sewage Sludges and Analysis of Their Potential Use as Fertilizers" JEQ 6:225-239, 1977.

[3] Camp, Dresser & McKee, Inc.: Municipal Wastewater Treatment Plant Sludge and Liquid Sidestreams (EPA 430/9-76-007), June 1976. Municipal Wastewater Systems Division, EPA, Washington, D.C.

[4] Municipal Sludge Management: EPA Construction Grants Program, An Overview of the Sludge Management Situation, (EPA 430/9-76-009) April 1976.

[5] Chaney, R.L. and P.M. Giordano; "Microelements as related to plant deficiencies and toxicities," Soils for Management and Utilization of Organic Wastes and Wastewaters, (1976) L.F. Elliott and F.J. Stevenson (eds); Soil Science Society of America, Madison, Wisconsin.

[6] Sommers, L.E., D.W. Nelson, and K.J. Yost, "Variable Nature of Chemical Composition of Sewage Sludges" JEQ 5:303-306, 1976.

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APPENDIX VIII

Considerations for Applying Sewage Sludge on Agricultural Land*

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*adapted from: "Application of Sludges and Wastewater on Agricultural Land: A Planning and Educational Guide" in Section 3 by L.E. Sommers and D.W. Nelson. North Central Regional Committee (ND-118) and Wester Regional Committee (W-124), North Central Regional Research Publication 235, October 1976

This procedure for calculating sludge application rates is intended for use on privately owned and managed agricultural land. On large-scale, municipally owned and managed systems, where monitoring is regularly performed, the use of higher sludge loading rates may be possible. Determination of such loading rates is site specific as described in the Bulletin.

The following information is needed prior to calculating the rate of sludge application:

- Sludge composition
- Soil pH, cation exchange capacity, and lime requirement to adjust soil to pH 6.5
- Soil test for available P and K; P and K fertilizer recommendation for crop to be grown
- Crops to be grown

The rate of sludge application to land is based on the nitrogen requirement of the crop grown and the metal content of the sludge. If the sludge being applied has a low metal content, then it is possible to use sludge as nitrogen fertilizer material. However, if the sludge contains high concentrations of metals (i.e., Zn>5000ppm, Cu>1000ppm, Ni>500ppm, or Cd>50ppm, all on a dry weight basis), then the sludge may be used as a supplemental nitrogen source only. In either case, it may be necessary to use commercial fertilizer materials to furnish potassium for crop growth. The ranges of nitrogen, phosphorus, and potassium contents found in anaerobically digested sewage sludges are shown in Table 3.2.

TABLE 2.3--Composition of Representative Anaerobic Sewage Sludges

Component	Range*	Lb./Ton**
Organic nitrogen	1% - 5%	20 - 100
Ammonium nitrogen	1% - 3%	20 - 60
Total phosphorus	1.5% - 3%	30 - 60
Total potassium	0.27%- 0.8%	4 - 16

*Percent of oven-dry solids
**Lb./ton dry sludge

After addition to soil, sewage sludge is slowly decomposed, resulting in release of nitrogen available for plant growth. Available data suggest that 15-20% of the organic nitrogen is converted to plant available forms the first year and that 3% of the remaining organic nitrogen is released each year for at least three subsequent years. Thus, plant available nitrogen is released for several years after sludge has been added to soils. For example, decomposition of a sludge containing 3% organic nitrogen applied at 10 tons/acre/year for 3 years will release 41 lbs. of nitrogen the fourth year. Thus, sludge application rates are based on the quantity of readily available nitrogen in sludge (i.e., NH_4^+ and NO_3^-) and on the amount of nitrogen released during sludge decomposition in soil. Because of nitrogen losses from denitrification, ammonia volatilization, etc., nitrogen from sludge approximately equal to or 50% higher than the crop nitrogen requirement can be applied to soils with minimal environmental risk. If sludge is incorporated immediately (e.g., injected), then available nitrogen from sludge equal to the crop nitrogen requirement should be added. Although phosphorus toxicity to crops is not a problem in most cases, the level of available phosphorus in soils receiving sludge should be checked and serious consideration given to discontinuing sludge applications if available phosphorus exceeds 1500 lb/acre. The crop most susceptible to injury from excess phosphorus appears to be soybeans.

The criteria used to prevent metal injury from sludge application on land are based upon the total amount of Pb, Cu, Zn, Ni, and Cd added in sludges. Whereas nitrogen commonly limits the annual application rate of sludge, metals in sludge will determine the length of time a given acreage can receive sludge. The upper limit for metal addition is given in Table 3.3. In addition to the maximum accumulation of Cd shown, the rates of sludge application should result in no more than 2 lb of Cd per acre being applied on an annual basis.

TABLE 3.3--Total Amount of Sludge Metals Allowed on Agricultural Land

	Soil Cation Exchange Capacity (meq/100g)*		
Metal	0 - 5	5 - 15	>15
	Maximum Amount of Metal (Lb/Acre)		
Pb	500	1000	2000
Zn	250	500	1000
Cu	125	250	500
Ni	50	100	200
Cd	5	10	20

*Determined by the pH 7 ammonium acetate procedure.

These values are the total amounts of metals which can be added to soils. With metal contaminated sludges, one of the above criteria may be met with a single application, whereas 5, 10, or 20 applications may

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be needed for "clean" domestic sludges. A soil pH >6.5 must be maintained in all sites after sludge is applied to reduce the solubility and plant uptake of these potentially toxic heavy metals.

Calculation of Annual Application Rate

Step 1. Obtain N requirement for the crop grown from Table 3.4.

Step 2. Calculate tons of sludge needed to meet crop's N requirement

a. Available N in sludge

% Inorganic N (N_i) = (% NH_4-N) + (% NO_3-N)

% Organic N (N_o) = (% total N) - (% inorganic N)

Lb available N/ton sludge = (% N_i x 20) + (% N_o x 4)

b. Residual sludge N in soil

If the soil has received sludge in the past 3 years, calculate residual N from Table 3.5.

c. Annual application rate

i) tons sludge/acre = $\dfrac{\text{crop N requirement - residual N}}{\text{lb available N/ton sludge}}$

If sludge is surface applied this rate can be doubled

ii) Tons sludge/acre = $\dfrac{\text{2 lb Cd/acre}}{\text{ppm Cd x .002}}$

iii) The lower of the two amounts is applied.

TABLE 3.4--Annual Nitrogen, Phosphorus, and Potassium Utilization by Selected Crops.*

Crop	Yield	Nitrogen	Phosphorus	Potassium
		Lb per Acre		
Corn	150 bu.	185	35	178
	180 bu.	240	44	199
Corn silage	32 tons	200	35	203
Soybeans	50 bu.	257+	21	100
	60 bu.	336+	29	120
Grain sorghum	8,000 lb.	250	40	166
Wheat	60 bu.	125	22	91
	80 bu.	186	24	134
Oats	100 bu.	150	24	125
Barley	100 bu.	150	24	125
Alfalfa	8 tons	450+	35	398
Orchard grass	6 tons	300	44	311
Brome grass	5 tons	166	29	211
Tall fescue	3.5 tons	135	29	154
Bluegrass	3 tons	200	24	149

*Values reported above are from reports by the Potash Institute of America and are for the total above-ground portion of the plants. Where only grain is removed from the field, a significant proportion of the nutrients is left in the residues. However, since most of these nutrients are temporarily tied up in the residues, they are not readily available for crop use. Therefore, for the purpose of estimating nutrient requirements for any particular crop year, complete crop removal can be assumed.

+Legumes get most of their nitrogen from the air, so additional nitrogen sources are not normally needed.

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Table 3.5--Release of Residual Nitrogen During Sludge Decomposition in Soil.

Years After Sludge Application	Organic N Content of Sludge %						
	2.0	2.5	3.0	3.5	4.0	4.5	5.0
	Lb N Released per Ton Sludge Added						
1	1.0	1.2	1.4	1.7	1.9	2.2	2.4
2	0.9	1.2	1.4	1.6	1.8	2.1	2.3
3	0.0	1.1	1.3	1.5	1.7	2.0	2.2

Step 3. Calculate total amount of sludge allowable.

a. Obtain maximum amounts of Pb, Zn, Cu, Ni, and Cd allowed for CEC of the soil from Table 3.5 in lb/acre.

b. Calculate amount of sludge needed to exceed Pb, Zn, Cu, Ni, and Cd limits, using sludge analysis data.

Metal

Pb: $$\text{Tons sludge/acre} = \frac{\text{lb Pb/acre}}{\text{ppm Pb} \times .002}$$

Zn: $$\text{Tons sludge/acre} = \frac{\text{lb Zn/acre}}{\text{ppm Zn} \times .002}$$

Cu: $$\text{Tons sludge/acre} = \frac{\text{lb Cu/acre}}{\text{ppm Cu} \times .002}$$

Ni: $$\text{Tons sludge/acre} = \frac{\text{lb Ni/acre}}{\text{ppm Ni} \times .002}$$

Cd: $$\text{Tons sludge/acre} = \frac{\text{lb Cd/acre}}{\text{ppm Cd} \times .002}$$

(Note: Sludge metals should be expressed on a dry weight ppm (mg/kg) basis.)

The lowest value is chosen from the above five calculations as the maximum tons of sludge/acre which can be applied.

Step 4. Calculate amount of P and K added in sludge.

Tons of sludge x % P in sludge x 20 = lb of P added

Tons of sludge x % K in sludge x 20 = lb of K added

Step 5. Calculate amount of P and K fertilizer needed.

(lb P recommended for crop)* - (lb P in sludge) = lb P fertilizer needed

(lb K recommended for crop)* - (lb K in sludge) = lb K fertilizer [redacted]

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*P and K recommendations based on soil tests for available [illegible] and K

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APPENDIX IX

FDA Recommendations

FDA Recommendations

Based upon comments made on the July 3, 1976, proposed version of the Technical Bulletin that contained no suggested limitations for annual or cumulative loading rates, FDA recommended the following limitations on the application of sludge to land used to grow human and animal food, in order to maximize the protection of public health:

(a) Sludges should not contain more than 20 ppm cadmium, 1000 ppm lead or 10 ppm PCB's on the dry basis;

(b) In support of the limits proposed by the W 124/NC 118 Committees of Land Grant Colleges, the maximum total which should ever be added to an average soil (cation exchange capacity of 5-15) is 9 pounds/acre of cadmium and 900 pounds/acre of lead;

(c) Crops which are customarily eaten raw should not be planted within three years after the last sludge application;

(d) Crops such as green beans, corn, potatoes, etc., which may contaminate other food in the kitchen before cooking, should not be grown in sludge-treated land unless the sludge gives a negative test for pathogens;

(e) Because sewage can be regarded as filth, food physically contaminated with sludge can be considered adulterated even though there is no direct health hazards. Sludge should not be applied directly to growing or mature crops where sludge particles may remain in or on the food;

(f) With commercial compost and bagged fertilizer products derived from sludges, proper labeling should be provided to minimize any contamination of crops in the human food chain which may result from their use.

FDA further suggested that possible exceptions to the Cd and Pb levels indicated above could involve carefully controlled and monitored practices in which total and annual sludge and toxic metals application rates are carefully limited.

These recommendations along with many others were utilized in the development of the guidance provided by this Technical Bulletin.

APPENDIX X

Sources of Data and Technical Assistance on Applying Sludge to the Land

SOURCES OF DATA AND TECHNICAL ASSISTANCE

To assist the evaluator and engineer in data-gathering and evaluation, some major sources of data are listed for climate, topography, soil characteristics, geologic formations, groundwater, and receiving water. It must be stressed that these do not represent all the possible sources of data.

CLIMATE

Information on precipitation, temperature, humidity, and winds may be obtained from the following sources:

- National Weather Service, local offices
- Climatological Data, published by the National Weather Service, Department of Commerce
- Airports
- Military installations
- Universities

Additionally, data on evapotranspiration can usually be obtained from the following sources:

- Agricultural Extension Service
- Agricultural Experiment Stations
- Agencies managing large water reservoirs

The National Oceanographic and Atmospheric Administration has prepared a report for EPA on weather parameters that influence winter operations of land application systems. This report, "Use of Climatic Data in Estimating Storage Days for Soil Treatment Systems" EPA 600/2-76-250, and others should be useful in designing land application systems.

TOPOGRAPHY

Topographic maps and aerial photographs can provide much of the information needed to analyze the topography. Topographic maps are most widely available from the U.S. Geological Survey in 7.5- and 15-minute quadrangles. Aerial photographs, when they exist, may be located by contacting the following sources:

- U.S. Department of Agriculture, Commodity Stabilization program
- Local or county planning departments
- U.S. Corps of Engineers offices
- Private photogrammetry and mapping companies

SOIL CHARACTERISTICS

Consultation with the Soil Conservation Service (U.S. Department of Agriculture) to obtain information on soil characteristics is highly recommended. SCS offices exist in most counties; however, each county office does not necessarily have a soil scientist. The state soil scientists should therefore be contacted. Additionally, SCS has published many soil maps with descriptions of soil characteristics to a depth of 5 feet. These descriptions include ground slopes, existing land use, erosion potential, and surface drainage, which are also important considerations. Agricultural Extension Service representatives, consulting soil scientists, or agronomists may have additional information on soil characteristics.

GEOLOGIC FORMATIONS

The U.S. Geological Service is the primary source of data on geological formations. Geologic maps and investigative reports are available for many areas. State mine and geology agencies may also have information on geologic formations in terms of maps or reports.

GROUNDWATER

Data on groundwater may come from a number of different sources, such as state water resource agencies, the U.S. Geological Service, local or county water conservation districts, and users of groundwater (municipalities, water companies, and individuals).

RECEIVING WATER

The U.S. Geological Service has monitoring gauges on most large streams and many small ones. In addition to this flow data, data on temperature and mineral quality area collected. The EPA has a computer storage system (called STORET) that contains a great deal of water quality data from one-time studies and continuous monitoring by federal, state, and local agencies. STORET output can be obtained at Regional EPA offices.

TECHNICAL ASSISTANCE

US EPA

- Office of Water Program Operations, Washington, DC 20460
- Office of Solid Waste, Washington, DC 20460
- Office of Air, Land and Water Use, Washington, DC 20460
- Municipal Environmental Research Lab, Cincinnati, OH 45268

FDA

- Bureau of Foods, Washington, DC 20204

USDA

- SCS (Assistant Administrator for Field Services), Washington, DC 20013

States

- Agricultural Experiment Stations
- State Agriculture Departments

Universities

- Agriculture Extension Programs
- Departments of Crops and Soil Sciences
- Institutes for Water Research

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